APPENDIX I

DATA QUALITY ASSURANCE REVIEW MEMORANDA AND ANALYTICAL DATA FORMS (COLUMBIA RIVER SEDIMENT SAMPLE RESULTS FOR METALS ONLY. ALL OTHERS AVAILABLE UPON REQUEST)

Upper Columbia River ESI
Duplicate EPA Sample IDs

SAMPNO_EPA	SAMPNO_WES	FORM_NO	FORM_TYPE	STATION	DEPTH	DEPTH_TO	MEDIAMOD	MEDIA	SAMP_DATE	date rec'd	SDG No.	Lab Sample ID
MJ09G0	TR-085-SD	I-TOTAL	SENTNL-1	TR-085-SD	0 in	1.5in	SURFACE	SEDIMENT	6/6/2001	6/8/2001	MJOBK7	38466S
MJ09G0	TR-114-SD	I-TOTAL	SENTNL-1	TR-114-SD	0 in	2 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJOBG8	38356S
MJ0BJ1	TR-106-SD	I-TOTAL	SENTNL-1	TR-106-SD	0 in	1.5in	SURFACE	SEDIMENT	6/4/2001	6/6/2001	MJ0976	38323S
MJ0BJ1	TR-112-SD	I-TOTAL		TR-112-SD	0 in	5 in	SURFACE	SEDIMENT	6/9/2001	6/12/2001	MJ0BN0	38488S
MJ0BJ2	TR-107-SD	I-TOTAL	SENTNL-1	TR-107-SD	0 in	2 in	SURFACE	SEDIMENT	6/4/2001	6/6/2001	MJ09G8	38325S
MJ0BJ2	TR-127-SD	I-TOTAL	SENTNL-1	TR-127-SD	0 in	6 in	SURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BN0	38489S
MJ0BJ3	RS-003-SD	I-TOTAL	SENTNL-1	N/A	N/A	N/A	RINS.BLANK	WATER	6/8/2001	6/12/2001	MJ0BN0	38490S
MJ0BJ3	TR-108-SD	I-TOTAL	SENTNL-1	TR-108-SD	0 in	1 in	SURFACE	SEDIMENT	6/4/2001	6/6/2001	MJ09G8	38326S
MJ0BJ4	TR-056-SD	I-TOTAL	SENTNL-1	TR-056-SD	0 in	2 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38358S
MJ0BJ4	TR-125-SD	I-TOTAL	SENTNL-1	TR-125-SD	0 in	3 in	SURFACE	SEDIMENT	6/9/2001	6/12/2001	MJ0BN0	38491S
MJ0BJ5	TR-040-SD	I-TOTAL	SENTNL-1	TR-040-SD	0 in	3 in	SURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BN0	38492S
MJ0BJ5	TR-057-SD	I-TOTAL	SENTNL-1	TR-057-SD	0 in	0.5in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38359S
MJ0BJ6	TR-041-SD	I-TOTAL	SENTNL-1	TR-041-SD	0 in	1 in	SURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BN0	38493S
MJ0BJ6	TR-059-SD	I-TOTAL	SENTNL-1	TR-059-SD	0 in	3 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38360S
MJ0BJ7	TR-042-SD	I-TOTAL	SENTNL-1	TR-042-SD	0 in	5 in	SURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BN0	38494S
MJ0BJ7	TR-062-SD	I-TOTAL	SENTNL-1	TR-062-SD	0 in	2 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38361S
MJ0BJ8	TR-043-SD	I-TOTAL	SENTNL-1	TR-043-SD	0 in	4 in	SURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BN0	38495S
MJ0BJ8	TR-064-SD	I-TOTAL	SENTNL-1	TR-064-SD	0 in	1 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38362S
MJ0BJ9	TR-044-SD	I-TOTAL	SENTNL-1	TR-044-SD	0 in	4 in	SURFACE	SEDIMENT	6/9/2001	6/12/2001	MJ0BN0	38496S
MJ0BJ9	TR-066-SD	I-TOTAL	SENTNL-1	TR-066-SD	0 in	2 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38363S
MJ0BK0	TR-045-SD	I-TOTAL		TR-045-SD	0 in	2 in	SURFACE	SEDIMENT	6/9/2001	6/12/2001	MJ0BN0	38497S
MJ0BK0	TR-115-SD	I-TOTAL		TR-115-SD	0 in	1 in	SURFACE	SEDIMENT	6/6/2001			
MJ0BK2	TR-047-SD	I-TOTAL		TR-047-SD	0 in	4 in	SURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BN0	38498S
MJ0BK2	TR-117-SD	I-TOTAL	SENTNL-1	TR-117-SD	0 in	2 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38365S
MJ0BK3	TR-118-SD	I-TOTAL	SENTNL-1	TR-118-SD	0 in	3 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38366S
MJ0BK3	TR-126-SD	I-TOTAL		TR-126-SD	0 in	4 in	SURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BN0	38499S
MJ0BK4	CR-062-SD	I-TOTAL		CR-062-SD	18 in	24 in	SUBSURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BN0	38500S
MJ0BK4	TR-119-SD	I-TOTAL	SENTNL-1	TR-119-SD	0 in	3 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38367S
MJ0BK5	TR-038-SD	I-TOTAL		TR-038-SD	0 in	1 in	SURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BN0	38501S
MJ0BK5	TR-120-SD	I-TOTAL	SENTNL-1	TR-120-SD	0 in	3 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38368S
MJ0BK6	TR-039-SD	I-TOTAL		TR-039-SD	0 in	1.5in	SURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BN0	38502S
MJ0BK6	TR-121-SD	I-TOTAL	SENTNL-1	TR-121-SD	0 in	5 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ09G8	38369S
MJ0BK7	TR-037-SD	I-TOTAL	SENTNL-1	TR-037-SD	0 in	3.5in	SURFACE	SEDIMENT	6/8/2001	6/12/2001	MJ0BK0	38503S
MJ0BK7	TR-122-SD	I-TOTAL		TR-122-SD	0 in	2 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ0BK7	38370S
MJ0BK8	TR-071-SD	I-TOTAL	SENTNL-1	TR-071-SD	0 in	1 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ0BK7	38371S
MJ0BK8	TR-128-SD	I-TOTAL		TR-128-SD	0 in	4 in	SURFACE	SEDIMENT	6/9/2001	6/12/2001	MJ0BK0	38504S
MJ0BK9	TR-072-SD	I-TOTAL	SENTNL-1	TR-072-SD	0 in	1 in	SURFACE	SEDIMENT	6/5/2001	6/7/2001	MJ0BK7	38372S
MJ0BK9	TR-129-SD	I-TOTAL		TR-129-SD	0 in	6 in	SURFACE	SEDIMENT	6/9/2001	6/12/2001	MJ0BK0	38505S

ENVIRONMENTAL SERVICES ASSISTANCE TEAM

ESAT Region 10
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received 8-6-01 SMF

DELIVERABLE NARRATIVE

DATE: July 12, 2001

To: Ginna Grepo-Grove, TOPO, USEPA, Region 10

THROUGH: Dave Dobb, Team Manager, ESAT Region 10 DD

FROM: Chris Pace, Data Validation Task Lead, ESAT Region 10 CP

SUBJECT: Data Validation Report for the Inorganic Analysis of Samples from the Upper Columbia River Lake Roosevelt site. Case: 29276 SDG: MJ0BN0

Account Code: 01T10P50102D106XLA00

Doc. #: ES10-0-1085
TDN: 1042
Task Order: 001
Contract: 68-W-01-027

CC: Gerald Dodo, PO, USEPA, Region 10
Project File

The quality assurance (QA) review of 1 water and 19 soil samples collected from the above referenced site has been completed. These samples were analyzed for total metals by Sentinel, Inc. of Huntsville, AL. The following samples were reviewed in this validation report:

MJ09F8	MJ0BJ4	MJ0BJ9	MJ0BK5
MJ09G6	MJ0BJ5	MJ0BK0	MJ0BK6
MJ0BJ1	MJ0BJ6	MJ0BK2	MJ0BN0
MJ0BJ2	MJ0BJ7	MJ0BK3	MJ0BN1
MJ0BJ3	MJ0BJ8	MJ0BK4	MJ0BN2

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in the Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganic Analysis (ILM04.1) and the USEPA CLP Functional Guidelines for Inorganic Data Review, 2/94.

The conclusions presented herein are based on the information provided for the review.

Holding Time - Acceptable

The suggested holding time for mercury is 28 days from the date of sample collection and the holding time for the rest of the metals is 180 days. The samples were collected on 6/6, 6/7, 6/8 and 6/9/01. The samples were analyzed for mercury within 8 days and all other metals within 10 days of the sample collection date. None of the data were qualified on this basis.

Sample Preparation - Acceptable

The samples were prepared in accordance with the methods used. None of the data were qualified on this basis.

Initial Calibration - Acceptable

All of the samples were analyzed for total mercury using Cold Vapor Atomic Absorption Spectroscopy (CVAAS). The initial calibration for mercury met the frequency of analysis and the linearity criteria (correlation coefficients, r=>0.995).

The rest of the target analytes were analyzed using Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES). The initial calibration for ICP-AES met the frequency of analysis and the linearity criteria (correlation coefficients, r=>0.995).

None of the data were qualified on this basis.

Calibration Verification - Acceptable

The initial and continuing calibration verifications met the criteria for frequency of analysis and recovery criteria of 90-110% and 80-120% for mercury. The recoveries ranged from 91-105% for ICP-AES and from 83-95% for mercury. None of the data were qualified on this basis.

Detection Limits - Acceptable

All of the target analytes met the project required quantitation limits. All of the Contract Required Detection Limit (CRDL) checks met the frequency of analysis and recovery criteria.

Blanks

Procedural blanks were prepared with the samples to indicate potential contamination from the digestion or analytical procedure. If an analyte was found in the associated blank, the sample results were qualified as non-detects, "U", if the analyte concentration is less than five times the analytical value in the blank.

The frequency of analysis of blanks was met. Based on the target analytes detected in the procedural, initial and continuing calibration blanks, the following results were qualified as non-detects, "U":

Analyte	Associated Samples
antimony	MJ0BJ1, MJ0BJ4, MJ0BJ7, MJ0BJ9, MJ0BK3, MJ0BK4, MJ0BK5, MJ0BK6
lead	MJ0BJ3
manganese	MJ0BJ3
silver	all except MJ0BJ3, MJ0BK0

sodium	all except MJ0BJ3, MJ0BJ5, MJ0BK3
thallium	MJ0BJ3

ICP-AES Interference Check Sample - Acceptable

The ICP-AES interference check samples (ICS) were analyzed to verify inter-element and background correction factors. The frequency of analysis (beginning and end of sequence) and recovery criteria (80-120%) were met by all of the ICS analyzed. The recoveries ranged from 92-113%. None of the data were qualified on this basis.

ICP-AES Serial Dilution Analysis

Sample MJ0BK0 was analyzed for serial dilution. All of the analytes which exceeded the minimum concentration criterion (50 times the IDL) agreed within 10% difference with the exception of copper and lead. Results for copper and lead in the associated samples were qualified as estimated, "J". The "E" qualifiers applied by the laboratory were crossed-out by the reviewer.

Laboratory Control Sample - Acceptable

The frequency of analysis and the recovery criteria for the laboratory control samples were met. The aqueous recoveries ranged from 86-105% and the solid recoveries ranged from 64-107%. None of the data were qualified on this basis.

Duplicate Sample Analysis - Acceptable

Sample MJ0BK0 was utilized for duplicate analysis. The duplicate results met the frequency of analysis and method control limit criteria for all target analytes. None of the data were qualified on this basis.

Matrix Spike Analysis

Sample MJ0BK0 was used for the spike analysis. The frequency of analysis and recovery criteria were met with the exception of antimony (53%) in the spike sample MJ0BK0S. Due to possible bias, the detected and non-detected antimony results in the associated samples were qualified as estimated, "J/UJ". The "N" qualifiers applied by the laboratory were crossed-out by the reviewer. All of the other spike recoveries were acceptable and ranged from 81-122%.

Laboratory Contact

The laboratory was not contacted for this review.

Overall Assessment

The total number of data points was 460. Forty six (10%) were qualified as non-detected due to blank contamination. Fifty seven (12%) were qualified as estimated due to ICP serial dilution and spike analyses.

All of the samples were analyzed in accordance with technical specifications outlined in the SOW. The data, as qualified, are acceptable and can be used for all purposes.

DATA QUALIFIERS

U	-	The analyte was not detected at or above the reported result.
J	-	The analyte was positively identified. The associated numerical result is an estimate.
R	-	The data are unusable for all purposes.
N	-	There is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result. The associated numerical value is an estimate of the quantitation limit of the analyte in this sample.
L	-	Low bias.
H	-	High bias.
Q	-	The result is estimated because the concentration is below the Contract Required Quantitation Limits (CRQLs).
K	-	Unknown Bias.

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

ICP ID Number: P4 Date: 04/15/01

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	168.1	P
Antimony	206.80		60	3.0	P
Arsenic	189.00		10	4.0	P
Barium	493.40		200	1.7	P
Beryllium	313.00		5	0.2	P
Cadmium	226.50		5	0.3	P
Calcium	317.90		5000	136.5	P
Chromium	267.70		10	0.7	P
Cobalt	228.60		50	1.1	P
Copper	324.70		25	0.7	P
Iron	271.40		100	54.6	P
Lead	220.30		3	1.5	P
Magnesium	279.00		5000	132.2	P
Manganese	257.60		15	0.4	P
Mercury			0.2		NR
Nickel	231.60		40	1.5	P
Potassium	766.40		5000	15.4	P
Selenium	196.00		5	3.4	P
Silver	328.00		10	0.8	P
Sodium	330.20		5000	130.9	P
Thallium	190.80		10	3.9	P
Vanadium	292.40		50	0.9	P
Zinc	206.20		20	0.8	P
Cyanide			10		NR

Comments:
P4: THERMO JARRELL ASH

U.S. EPA - CLP

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

ICP ID Number: Date: 04/15/01

Flame AA ID Number: C5

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.1	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR
Cyanide			10		NR

Comments:

C5: CETAC M6000

U.S. EPA - CLP

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PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Method: P

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	06/13/01	1.00	200
LCSW	06/13/01		100
MJ09F8	06/13/01	1.02	200
MJ09G6	06/13/01	1.00	200
MJ0BJ1	06/13/01	1.02	200
MJ0BJ2	06/13/01	1.02	200
MJ0BJ3	06/13/01		100
MJ0BJ4	06/13/01	1.01	200
MJ0BJ5	06/13/01	1.00	200
MJ0BJ6	06/13/01	1.00	200
MJ0BJ7	06/13/01	1.02	200
MJ0BJ8	06/13/01	1.00	200
MJ0BJ9	06/13/01	1.00	200
MJ0BK0	06/13/01	1.00	200
MJ0BK0D	06/13/01	1.00	200
MJ0BK0S	06/13/01	1.00	200
MJ0BK2	06/13/01	1.01	200
MJ0BK3	06/13/01	1.02	200
MJ0BK4	06/13/01	1.00	200
MJ0BK5	06/13/01	1.02	200
MJ0BK6	06/13/01	1.00	200
MJ0BN0	06/13/01	1.00	200
MJ0BN1	06/13/01	1.00	200
MJ0BN2	06/13/01	1.01	200
PBS	06/13/01	1.00	200
PBW	06/13/01		100

U.S. EPA - CLP

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PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Method: CV

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	06/13/01	0.20	100
MJ09F8	06/13/01	0.21	100
MJ09G6	06/13/01	0.21	100
MJ0BJ1	06/13/01	0.20	100
MJ0BJ2	06/13/01	0.22	100
MJ0BJ3	06/13/01		100
MJ0BJ4	06/13/01	0.20	100
MJ0BJ5	06/13/01	0.21	100
MJ0BJ6	06/13/01	0.21	100
MJ0BJ7	06/13/01	0.21	100
MJ0BJ8	06/13/01	0.22	100
MJ0BJ9	06/13/01	0.22	100
MJ0BK0	06/13/01	0.20	100
MJ0BK0D	06/13/01	0.20	100
MJ0BK0S	06/13/01	0.20	100
MJ0BK2	06/13/01	0.22	100
MJ0BK3	06/13/01	0.22	100
MJ0BK4	06/13/01	0.22	100
MJ0BK5	06/13/01	0.22	100
MJ0BK6	06/13/01	0.20	100
MJ0BN0	06/13/01	0.20	100
MJ0BN1	06/13/01	0.20	100
MJ0BN2	06/13/01	0.20	100
PBS	06/13/01	0.20	100
PBW	06/13/01		100

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ09F8

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38486S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 96.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8190			P
7440-36-0	Antimony	1.0	B	≠ JL	P
7440-38-2	Arsenic	25.5			P
7440-39-3	Barium	75.4			P
7440-41-7	Beryllium	0.34	B	JL	P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	16700			P
7440-47-3	Chromium	31.4			P
7440-48-4	Cobalt	7.0	B	JL	P
7440-50-8	Copper	15.6		≠ JL	P
7439-89-6	Iron	17300			P
7439-92-1	Lead	7.8		≠ JL	P
7439-95-4	Magnesium	5960			P
7439-96-5	Manganese	296			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	28.4			P
7440-09-7	Potassium	1020			P
7782-49-2	Selenium	0.69	U		P
7440-22-4	Silver	0.60	B U		P
7440-23-5	Sodium	216	B U		P
7440-28-0	Thallium	0.79	U		P
7440-62-2	Vanadium	28.0			P
7440-66-6	Zinc	55.6			P
	Cyanide				NR

B
FEB 04 2002

7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ09G6

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38487S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 95.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5120			P
7440-36-0	Antimony	0.81	B	~~N~~ JL	P
7440-38-2	Arsenic	2.4			P
7440-39-3	Barium	51.5			P
7440-41-7	Beryllium	0.23	B	JK	P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	9240			P
7440-47-3	Chromium	9.4			P
7440-48-4	Cobalt	3.0	B	JK	P
7440-50-8	Copper	7.9		~~N~~ JL	P
7439-89-6	Iron	8670			P
7439-92-1	Lead	6.7		~~N~~ JL	P
7439-95-4	Magnesium	4470			P
7439-96-5	Manganese	146			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.2	B	JK	P
7440-09-7	Potassium	1180			P
7782-49-2	Selenium	0.72	U		P
7440-22-4	Silver	0.37	~~B~~ U		P
7440-23-5	Sodium	212	~~B~~ U		P
7440-28-0	Thallium	0.82	U		P
7440-62-2	Vanadium	14.4			P
7440-66-6	Zinc	37.3			P
	Cyanide				NR

B
FEB 04 2002

CP 1-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0BJ1

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38488S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 75.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4410			P
7440-36-0	Antimony	0.91	B	UJK	P
7440-38-2	Arsenic	1.4	B	JK	P
7440-39-3	Barium	57.4			P
7440-41-7	Beryllium	0.22	B	JK	P
7440-43-9	Cadmium	0.08	U		P
7440-70-2	Calcium	22800			P
7440-47-3	Chromium	15.8			P
7440-48-4	Cobalt	2.5	B	JK	P
7440-50-8	Copper	8.2		JL	P
7439-89-6	Iron	8030			P
7439-92-1	Lead	6.5		JL	P
7439-95-4	Magnesium	2780			P
7439-96-5	Manganese	134			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	7.4	B	JK	P
7440-09-7	Potassium	767	B	JK	P
7782-49-2	Selenium	0.92	B	JK	P
7440-22-4	Silver	0.34	B	U	P
7440-23-5	Sodium	254	B	U	P
7440-28-0	Thallium	1.0	U		P
7440-62-2	Vanadium	13.3			P
7440-66-6	Zinc	32.2			P
	Cyanide				NR

B

FEB 04 2002

7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

S

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0BJ2

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38489S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 75.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8710			P
7440-36-0	Antimony	9.6	B	~~N~~ JL	P
7440-38-2	Arsenic	12.0			P
7440-39-3	Barium	288			P
7440-41-7	Beryllium	0.37	B	JK	P
7440-43-9	Cadmium	10.5			P
7440-70-2	Calcium	5510			P
7440-47-3	Chromium	12.3			P
7440-48-4	Cobalt	4.5	B	JK	P
7440-50-8	Copper	15.1		~~E~~ JL	P
7439-89-6	Iron	11400			P
7439-92-1	Lead	405		~~E~~ JL	P
7439-95-4	Magnesium	2770			P
7439-96-5	Manganese	1210			P
7439-97-6	Mercury	0.08	B	JK	CV
7440-02-0	Nickel	10.8			P
7440-09-7	Potassium	1490			P
7782-49-2	Selenium	0.88	U		P
7440-22-4	Silver	0.72	~~B~~ U		P
7440-23-5	Sodium	273	~~B~~ U		P
7440-28-0	Thallium	1.0	U		P
7440-62-2	Vanadium	17.7			P
7440-66-6	Zinc	495			P
	Cyanide				NR

B
FEB 0 4 2002

CP 1-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0BJ3

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): WATER Lab Sample ID: 38490S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	168	U		P
7440-36-0	Antimony	3.0	U		P
7440-38-2	Arsenic	4.0	U		P
7440-39-3	Barium	1.7	U		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	136	U		P
7440-47-3	Chromium	0.70	U		P
7440-48-4	Cobalt	1.1	U		P
7440-50-8	Copper	1.2	B	JK	P
7439-89-6	Iron	54.6	U		P
7439-92-1	Lead	1.8	~~B~~ U		P
7439-95-4	Magnesium	132	U		P
7439-96-5	Manganese	0.40	~~B~~ U		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.5	U		P
7440-09-7	Potassium	167	B	JK	P
7782-49-2	Selenium	3.4	U		P
7440-22-4	Silver	0.80	U		P
7440-23-5	Sodium	515	B	JK	P
7440-28-0	Thallium	4.3	~~B~~ U		P
7440-62-2	Vanadium	0.90	U		P
7440-66-6	Zinc	5.2	B	JK	P
	Cyanide				NR

B

FEB 04 2002

CP 1-12-01

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:
FIELD BLANK

7

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0BJ4

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38491S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 73.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3760			P
7440-36-0	Antimony	1.1	~~B~~	~~N~~ UJK	P
7440-38-2	Arsenic	1.1	U		P
7440-39-3	Barium	25.9	B	JK	P
7440-41-7	Beryllium	0.15	B	JK	P
7440-43-9	Cadmium	0.08	U		P
7440-70-2	Calcium	1850			P
7440-47-3	Chromium	9.4			P
7440-48-4	Cobalt	1.9	B	JK	P
7440-50-8	Copper	13.6		~~E~~ JL	P
7439-89-6	Iron	5970			P
7439-92-1	Lead	5.8		~~E~~ JL	P
7439-95-4	Magnesium	1920			P
7439-96-5	Manganese	77.5			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	5.8	B	JK	P
7440-09-7	Potassium	576	B	JK	P
7782-49-2	Selenium	0.91	U		P
7440-22-4	Silver	0.45	~~B~~ U		P
7440-23-5	Sodium	303	~~B~~ U		P
7440-28-0	Thallium	1.0	U		P
7440-62-2	Vanadium	10.6	B	JK	P
7440-66-6	Zinc	20.7			P
	Cyanide				NR

B

FEB 0 4 2002

7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0BJ5

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38492S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 66.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5940			P
7440-36-0	Antimony	0.90	U	~~J~~ UJK	P
7440-38-2	Arsenic	9.7			P
7440-39-3	Barium	42.6	B	JK	P
7440-41-7	Beryllium	0.20	B	JK	P
7440-43-9	Cadmium	0.09	U		P
7440-70-2	Calcium	4590			P
7440-47-3	Chromium	16.6			P
7440-48-4	Cobalt	4.7	B	JK	P
7440-50-8	Copper	10.6		~~J~~ JL	P
7439-89-6	Iron	12500			P
7439-92-1	Lead	7.2		~~J~~ JL	P
7439-95-4	Magnesium	4240			P
7439-96-5	Manganese	192			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	25.9			P
7440-09-7	Potassium	771	B	JK	P
7782-49-2	Selenium	1.0	U		P
7440-22-4	Silver	0.75	~~B~~ U		P
7440-23-5	Sodium	408	B	JK	P
7440-28-0	Thallium	1.2	U		P
7440-62-2	Vanadium	29.3			P
7440-66-6	Zinc	37.0			P
	Cyanide				NR

B

FEB 0 4 2002

CP 1-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0BJ6

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38493S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 40.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4900			P
7440-36-0	Antimony	1.5	U	~~J~~UJK	P
7440-38-2	Arsenic	5.2			P
7440-39-3	Barium	105			P
7440-41-7	Beryllium	0.17	B	JK	P
7440-43-9	Cadmium	0.16	B	JK	P
7440-70-2	Calcium	49100			P
7440-47-3	Chromium	14.9			P
7440-48-4	Cobalt	3.6	B	JK	P
7440-50-8	Copper	11.5	B	~~J~~JL	P
7439-89-6	Iron	9410			P
7439-92-1	Lead	11.3		~~J~~JL	P
7439-95-4	Magnesium	3210			P
7439-96-5	Manganese	993			P
7439-97-6	Mercury	0.12	U		CV
7440-02-0	Nickel	9.9	B	JK	P
7440-09-7	Potassium	705	B	JK	P
7782-49-2	Selenium	1.7	U		P
7440-22-4	Silver	0.49	~~B~~U		P
7440-23-5	Sodium	523	~~B~~U		P
7440-28-0	Thallium	1.9	U		P
7440-62-2	Vanadium	16.7	B	JK	P
7440-66-6	Zinc	42.2			P
	Cyanide				NR

B
FEB 04 2002

AP 7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

FORM I - IN ILM04.1

10

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0BJ7

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38494S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 75.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4190			P
7440-36-0	Antimony	1.2	B	UJK	P
7440-38-2	Arsenic	4.8			P
7440-39-3	Barium	42.4	B	JK	P
7440-41-7	Beryllium	0.21	B	JK	P
7440-43-9	Cadmium	0.08	U		P
7440-70-2	Calcium	13700			P
7440-47-3	Chromium	11.3			P
7440-48-4	Cobalt	3.9	B		P
7440-50-8	Copper	10.2		JL	P
7439-89-6	Iron	10900			P
7439-92-1	Lead	9.3		JL	P
7439-95-4	Magnesium	3480			P
7439-96-5	Manganese	183			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	11.7			P
7440-09-7	Potassium	571	B	JK	P
7782-49-2	Selenium	0.88	U		P
7440-22-4	Silver	0.51	B	U	P
7440-23-5	Sodium	237	B	U	P
7440-28-0	Thallium	1.0	U		P
7440-62-2	Vanadium	20.0			P
7440-66-6	Zinc	48.4			P
	Cyanide				NR

B

FEB 04 2002

CP 7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0BJ8

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38495S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 71.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3090			P
7440-36-0	Antimony	0.83	U	~~J~~UJK	P
7440-38-2	Arsenic	1.6	B	JK	P
7440-39-3	Barium	41.5	B	JK	P
7440-41-7	Beryllium	0.17	B	JK	P
7440-43-9	Cadmium	0.17	B	JK	P
7440-70-2	Calcium	6380			P
7440-47-3	Chromium	4.6			P
7440-48-4	Cobalt	1.6	B	JK	P
7440-50-8	Copper	3.9	B	~~J~~JL	P
7439-89-6	Iron	6230			P
7439-92-1	Lead	13.2		~~J~~JL	P
7439-95-4	Magnesium	2790			P
7439-96-5	Manganese	113			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	4.3	B	JK	P
7440-09-7	Potassium	701	B	JK	P
7782-49-2	Selenium	0.95	U		P
7440-22-4	Silver	0.40	~~B~~U		P
7440-23-5	Sodium	241	~~B~~U		P
7440-28-0	Thallium	1.1	U		P
7440-62-2	Vanadium	11.9	B	JK	P
7440-66-6	Zinc	98.4			P
	Cyanide				NR

B

FEB 04 2002

7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0BJ9

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38496S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 74.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6750			P
7440-36-0	Antimony	0.91	B	~~N~~ UJK	P
7440-38-2	Arsenic	3.8			P
7440-39-3	Barium	60.2			P
7440-41-7	Beryllium	0.26	B	JK	P
7440-43-9	Cadmium	0.11	B	JK	P
7440-70-2	Calcium	36200			P
7440-47-3	Chromium	15.7			P
7440-48-4	Cobalt	4.6	B	JK	P
7440-50-8	Copper	12.7		~~N~~ JL	P
7439-89-6	Iron	13900			P
7439-92-1	Lead	8.1		~~N~~ JL	P
7439-95-4	Magnesium	4910			P
7439-96-5	Manganese	208			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	16.0			P
7440-09-7	Potassium	1380			P
7782-49-2	Selenium	0.92	U		P
7440-22-4	Silver	0.59	~~B~~ U		P
7440-23-5	Sodium	297	~~B~~ U		P
7440-28-0	Thallium	1.1	U		P
7440-62-2	Vanadium	26.6			P
7440-66-6	Zinc	138			P
	Cyanide				NR

B

FEB 04 2002

CP 7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0BK0

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38497S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 69.3

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6480			P
7440-36-0	Antimony	1.1	B	~~N~~ JL	P
7440-38-2	Arsenic	3.7			P
7440-39-3	Barium	121			P
7440-41-7	Beryllium	0.31	B	JK	P
7440-43-9	Cadmium	1.8			P
7440-70-2	Calcium	110000			P
7440-47-3	Chromium	20.6			P
7440-48-4	Cobalt	4.5	B	JK	P
7440-50-8	Copper	18.3		~~E~~ JL	P
7439-89-6	Iron	10800			P
7439-92-1	Lead	29.3		~~E~~ JL	P
7439-95-4	Magnesium	4210			P
7439-96-5	Manganese	223			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	17.4			P
7440-09-7	Potassium	1450			P
7782-49-2	Selenium	1.7			P
7440-22-4	Silver	0.47	B	JK	P
7440-23-5	Sodium	294		~~B~~ U	P
7440-28-0	Thallium	1.1	U		P
7440-62-2	Vanadium	22.5			P
7440-66-6	Zinc	148			P
	Cyanide				NR

B

FEB 04 2002

CP 1-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0BK2

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38498S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 80.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3480			P
7440-36-0	Antimony	0.74	U	UJK	P
7440-38-2	Arsenic	2.6			P
7440-39-3	Barium	28.4	B	JK	P
7440-41-7	Beryllium	0.13	B	JK	P
7440-43-9	Cadmium	0.07	U		P
7440-70-2	Calcium	3330			P
7440-47-3	Chromium	7.4			P
7440-48-4	Cobalt	2.1	B	JK	P
7440-50-8	Copper	6.7		JL	P
7439-89-6	Iron	6850			P
7439-92-1	Lead	3.3		JL	P
7439-95-4	Magnesium	2470			P
7439-96-5	Manganese	123			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	8.3	B	JK	P
7440-09-7	Potassium	596	B	JK	P
7782-49-2	Selenium	0.84	U		P
7440-22-4	Silver	0.37	B	U	P
7440-23-5	Sodium	255	B	U	P
7440-28-0	Thallium	0.96	U		P
7440-62-2	Vanadium	12.4			P
7440-66-6	Zinc	21.2			P
	Cyanide				NR

B

FEB 04 2002

CP 7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0BK3

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38499S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 97.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6790			P
7440-36-0	Antimony	0.61	B	~~N~~ JK	P
7440-38-2	Arsenic	9.2			P
7440-39-3	Barium	73.4			P
7440-41-7	Beryllium	0.23	B	JK	P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	33400			P
7440-47-3	Chromium	17.6			P
7440-48-4	Cobalt	5.6	B	JK	P
7440-50-8	Copper	22.0		~~N~~ JL	P
7439-89-6	Iron	16500			P
7439-92-1	Lead	8.5		~~N~~ JL	P
7439-95-4	Magnesium	7750			P
7439-96-5	Manganese	250			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	17.9			P
7440-09-7	Potassium	1160			P
7782-49-2	Selenium	0.68	U		P
7440-22-4	Silver	0.73	~~B~~ U		P
7440-23-5	Sodium	282	B	JK	P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	30.7			P
7440-66-6	Zinc	50.5			P
	Cyanide				NR

B

FEB 04 2002

7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS024

EPA SAMPLE NO.

MJ0BK4

INORGANIC ANALYSIS DATA SHEET

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38500S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 58.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6810			P
7440-36-0	Antimony	1.6	B	UJK	P
7440-38-2	Arsenic	5.8			P
7440-39-3	Barium	147			P
7440-41-7	Beryllium	0.29	B	JK	P
7440-43-9	Cadmium	0.10	U		P
7440-70-2	Calcium	162000			P
7440-47-3	Chromium	12.9			P
7440-48-4	Cobalt	4.7	B	JK	P
7440-50-8	Copper	18.1		JL	P
7439-89-6	Iron	11700			P
7439-92-1	Lead	6.7		JL	P
7439-95-4	Magnesium	5090			P
7439-96-5	Manganese	327			P
7439-97-6	Mercury	0.08	U		CV
7440-02-0	Nickel	14.3			P
7440-09-7	Potassium	1330	B	JK	P
7782-49-2	Selenium	1.2	U		P
7440-22-4	Silver	0.32	B	U	P
7440-23-5	Sodium	337	B	U	P
7440-28-0	Thallium	1.3	U		P
7440-62-2	Vanadium	16.6	B	JK	P
7440-66-6	Zinc	42.3			P
	Cyanide				NR

FEB 04 2002

7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0BK5

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38501S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 83.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10300			P
7440-36-0	Antimony	1.5	B	~~N~~ UJK	P
7440-38-2	Arsenic	10.7			P
7440-39-3	Barium	124			P
7440-41-7	Beryllium	0.45	B	JK	P
7440-43-9	Cadmium	0.88	B	JK	P
7440-70-2	Calcium	12500			P
7440-47-3	Chromium	20.1			P
7440-48-4	Cobalt	7.9	B	JK	P
7440-50-8	Copper	30.0		~~J~~ JL	P
7439-89-6	Iron	18600			P
7439-92-1	Lead	65.5		~~J~~ JL	P
7439-95-4	Magnesium	5340			P
7439-96-5	Manganese	421			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	19.2			P
7440-09-7	Potassium	2860			P
7782-49-2	Selenium	0.80	U		P
7440-22-4	Silver	0.86	~~B~~ U		P
7440-23-5	Sodium	265	~~B~~ U		P
7440-28-0	Thallium	0.92	U		P
7440-62-2	Vanadium	28.3			P
7440-66-6	Zinc	123			P
	Cyanide				NR

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FEB 04 2002

CP 4-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0BK6

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38502S

Level (low/med): LOW Date Received: 06/12/01

% Solids: 37.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7350			P
7440-36-0	Antimony	2.5	~~B~~	~~N~~UJK	P
7440-38-2	Arsenic	2.1	U		P
7440-39-3	Barium	167			P
7440-41-7	Beryllium	0.34	B	JK	P
7440-43-9	Cadmium	0.50	B	JK	P
7440-70-2	Calcium	106000			P
7440-47-3	Chromium	21.4			P
7440-48-4	Cobalt	4.6	B	JK	P
7440-50-8	Copper	19.4		~~E~~ JL	P
7439-89-6	Iron	13200			P
7439-92-1	Lead	20.6		~~E~~ JL	P
7439-95-4	Magnesium	6700			P
7439-96-5	Manganese	167			P
7439-97-6	Mercury	0.13	U		CV
7440-02-0	Nickel	15.1	B	JK	P
7440-09-7	Potassium	1760	B	JK	P
7782-49-2	Selenium	3.8			P
7440-22-4	Silver	0.56	~~B~~ U		P
7440-23-5	Sodium	562	~~B~~ U		P
7440-28-0	Thallium	2.1	U		P
7440-62-2	Vanadium	20.1	B	JK	P
7440-66-6	Zinc	102			P
	Cyanide				NR

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FEB 04 2002

7-12-01

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0BN0

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38481S

Level (low/med): LOW Date Received: 06/09/01

% Solids: 76.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8560			P
7440-36-0	Antimony	0.91	B	~~N~~ JL	P
7440-38-2	Arsenic	2.1	B	JK	P
7440-39-3	Barium	87.4			P
7440-41-7	Beryllium	0.41	B	JK	P
7440-43-9	Cadmium	0.56	B	JK	P
7440-70-2	Calcium	10100			P
7440-47-3	Chromium	21.5			P
7440-48-4	Cobalt	4.6	B	JK	P
7440-50-8	Copper	27.0		~~E~~ JL	P
7439-89-6	Iron	11200			P
7439-92-1	Lead	34.0		~~E~~ JL	P
7439-95-4	Magnesium	3580			P
7439-96-5	Manganese	338			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	12.3			P
7440-09-7	Potassium	1870			P
7782-49-2	Selenium	1.3	B	JK	P
7440-22-4	Silver	0.60	~~B~~ U		P
7440-23-5	Sodium	255	~~B~~ U		P
7440-28-0	Thallium	1.0	U		P
7440-62-2	Vanadium	22.4			P
7440-66-6	Zinc	65.8			P
	Cyanide				NR

B
FEB 04 2002

CP 7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0BN1

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38482S

Level (low/med): LOW Date Received: 06/09/01

% Solids: 85.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3080			P
7440-36-0	Antimony	0.70	U	R U JK	P
7440-38-2	Arsenic	1.5	B	JK	P
7440-39-3	Barium	25.8	B	JK	P
7440-41-7	Beryllium	0.20	B	JK	P
7440-43-9	Cadmium	0.07	U		P
7440-70-2	Calcium	1420			P
7440-47-3	Chromium	5.9			P
7440-48-4	Cobalt	1.9	B		P
7440-50-8	Copper	6.4		R JL	P
7439-89-6	Iron	5700			P
7439-92-1	Lead	3.9		R JL	P
7439-95-4	Magnesium	1430			P
7439-96-5	Manganese	109			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	4.8	B	JK	P
7440-09-7	Potassium	792	B	JK	P
7782-49-2	Selenium	0.79	U		P
7440-22-4	Silver	0.23	B	U	P
7440-23-5	Sodium	178	B	U	P
7440-28-0	Thallium	0.91	U		P
7440-62-2	Vanadium	10.7	B	JK	P
7440-66-6	Zinc	15.8			P
	Cyanide				NR

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FEB 04 2002

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0BN2

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0BN0

Matrix (soil/water): SOIL Lab Sample ID: 38483S

Level (low/med): LOW Date Received: 06/09/01

% Solids: 98.3

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3670			P
7440-36-0	Antimony	0.60	U	UJK	P
7440-38-2	Arsenic	1.2	B	JK	P
7440-39-3	Barium	42.4			P
7440-41-7	Beryllium	0.22	B	JK	P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	2470			P
7440-47-3	Chromium	8.4			P
7440-48-4	Cobalt	3.7	B	JK	P
7440-50-8	Copper	7.3		J	P
7439-89-6	Iron	6800			P
7439-92-1	Lead	6.0		J	P
7439-95-4	Magnesium	2440			P
7439-96-5	Manganese	243			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.4			P
7440-09-7	Potassium	1120			P
7782-49-2	Selenium	0.68	U		P
7440-22-4	Silver	0.38	B	U	P
7440-23-5	Sodium	193	B	U	P
7440-28-0	Thallium	0.79	U		P
7440-62-2	Vanadium	12.8			P
7440-66-6	Zinc	22.4			P
	Cyanide				NR

B

FEB 0 4 2002

7-12-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

ENVIRONMENTAL SERVICES ASSISTANCE TEAM

received 8-6-01 SMF

ESAT Region 10
7411 Beach Drive East
Port Orchard, WA 98366
Phone (360) 871-8723

DELIVERABLE NARRATIVE

DATE: June 27, 2001

To: Ginna Grepo-Grove, TOPO, USEPA, Region 10

THROUGH: Dave Dobb, Team Manager, ESAT Region 10 DD

FROM: Chris Pace, Data Validation Task Lead, ESAT Region 10 CP

SUBJECT: Data Validation Report for the Inorganic Analysis of Samples from the Upper Columbia River Lake Roosevelt site. Case: 29276 SDG: MJ0904

Account Code: 01T10P50102D106XLA00

Doc. #: ES10-0-1070
TDN: 1035
Task Order: 001
Contract: 68-W-01-027

CC: Gerald Dodo, PO, USEPA, Region 10
Project File

The quality assurance (QA) review of 20 soil samples collected from the above referenced site has been completed. These samples were analyzed for total metals by Sentinel, Inc. of Huntsville, AL. The following samples were reviewed in this validation report:

MJ0904	MJ0910	MJ0915	MJ0920
MJ0905	MJ0911	MJ0916	MJ0921
MJ0907	MJ0912	MJ0917	MJ0922
MJ0908	MJ0913	MJ0918	MJ0923
MJ0909	MJ0914	MJ0919	MJ09E2

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in the Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganic Analysis (ILM04.1) and the USEPA CLP Functional Guidelines for Inorganic Data Review, 2/94.

The conclusions presented herein are based on the information provided for the review.

Holding Time - Acceptable

The suggested holding time for mercury is 28 days from the date of sample collection and the holding time for the rest of the metals is 180 days. The samples were collected on 5/18, 5/19, 5/21 and 5/22/01. The samples were analyzed for mercury within 13 days and all other metals within 14 days of the sample collection date. None of the data were qualified on this basis.

Sample Preparation - Acceptable

The samples were prepared in accordance with the methods used. None of the data were qualified on this basis.

Initial Calibration - Acceptable

All of the samples were analyzed for total mercury using Cold Vapor Atomic Absorption Spectroscopy (CVAAS). The initial calibration for mercury met the frequency of analysis and the linearity criteria (correlation coefficients, r=>0.995).

The rest of the target analytes were analyzed using Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES). The initial calibration for ICP-AES met the frequency of analysis and the linearity criteria (correlation coefficients, r=>0.995).

None of the data were qualified on this basis.

Calibration Verification - Acceptable

The initial and continuing calibration verifications met the criteria for frequency of analysis and recovery criteria of 90-110% and 80-120% for mercury. The recoveries ranged from 92-107% for ICP-AES and from 88-101% for mercury. None of the data were qualified on this basis.

Detection Limits - Acceptable

All of the target analytes met the project required quantitation limits. All of the Contract Required Detection Limit (CRDL) checks met the frequency of analysis and recovery criteria.

Blanks - Acceptable

Procedural blanks were prepared with the samples to indicate potential contamination from the digestion or analytical procedure. If an analyte was found in the associated blank, the sample results were qualified as non-detects, "U", if the analyte concentration is less than five times the analytical value in the blank.

The frequency of analysis of blanks was met. Based on the target analytes detected in the procedural, initial and continuing calibration blanks, the following results were qualified as non-detects, "U": None.

ICP-AES Interference Check Sample - Acceptable

The ICP-AES interference check samples (ICS) were analyzed to verify inter-element and background correction factors. The frequency of analysis (beginning and end of sequence) and recovery criteria (80-120%) were met by all of the ICS analyzed. The recoveries ranged from 85-112%. None of the data were qualified on this basis.

ICP-AES Serial Dilution Analysis

Sample MJ0920 was analyzed for serial dilution. All of the analytes which exceeded the minimum concentration criterion (50 times the IDL) agreed within 10% difference with the exception of copper. Results for copper in all samples were qualified as estimated, "J". The "E" qualifiers applied by the laboratory were crossed-out by the reviewer.

Laboratory Control Sample - Acceptable

The frequency of analysis and the recovery criteria for the laboratory control sample was met. The recoveries ranged from 59-109%. None of the data were qualified on this basis.

Duplicate Sample Analysis - Acceptable

Sample MJ0920 was utilized for duplicate analysis. The duplicate results met the frequency of analysis control limit criteria for all target analytes. None of the data were qualified on this basis.

Matrix Spike Analysis

Sample MJ0920 was used for the spike analysis. The frequency of analysis and recovery criteria were met with the exception of antimony (65%) in the spike sample MJ0920S. Due to possible bias, the detected and non-detected antimony results in all samples were qualified as estimated, "J/UJ". The "N" qualifiers applied by the laboratory were crossed-out by the reviewer. The recovery for lead could not be accurately determined because the concentration native to the sample was greater than 4 times the amount of spike added to the sample. All of the other spike recoveries were acceptable and ranged from 85-113%.

Laboratory Contact

The laboratory was not contacted for this review.

Overall Assessment

The total number of data points was 460. Forty (8.7%) were qualified as estimated due to spike analysis and ICP serial dilution.

All of the samples were analyzed in accordance with technical specifications outlined in the SOW. The data, as qualified, are acceptable and can be used for all purposes.

DATA QUALIFIERS

U	-	The analyte was not detected at or above the reported result.
J	-	The analyte was positively identified. The associated numerical result is an estimate.
R	-	The data are unusable for all purposes.
N	-	There is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result. The associated numerical value is an estimate of the quantitation limit of the analyte in this sample.
L	-	Low bias.
H	-	High bias.
Q	-	The result is estimated because the concentration is below the Contract Required Quantitation Limits (CRQLs).
K	-	Unknown Bias.

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

ICP ID Number: P4 Date: 04/15/01

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	168.1	P
Antimony	206.80		60	3.0	P
Arsenic	189.00		10	4.0	P
Barium	493.40		200	1.7	P
Beryllium	313.00		5	0.2	P
Cadmium	226.50		5	0.3	P
Calcium	317.90		5000	136.5	P
Chromium	267.70		10	0.7	P
Cobalt	228.60		50	1.1	P
Copper	324.70		25	0.7	P
Iron	271.40		100	54.6	P
Lead	220.30		3	1.5	P
Magnesium	279.00		5000	132.2	P
Manganese	257.60		15	0.4	P
Mercury			0.2		NR
Nickel	231.60		40	1.5	P
Potassium	766.40		5000	15.4	P
Selenium	196.00		5	3.4	P
Silver	328.00		10	0.8	P
Sodium	330.20		5000	130.9	P
Thallium	190.80		10	3.9	P
Vanadium	292.40		50	0.9	P
Zinc	206.20		20	0.8	P
Cyanide			10		NR

Comments:

P4: THERMO JARRELL ASH

U.S. EPA - CLP

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

ICP ID Number: Date: 04/15/01

Flame AA ID Number: C5

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.1	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR
Cyanide			10		NR

Comments:

C5: CETAC M6000

13
PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Method: P

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	05/31/01	1.00	200
MJ0904	05/31/01	1.00	200
MJ0905	05/31/01	1.01	200
MJ0907	05/31/01	1.00	200
MJ0908	05/31/01	1.01	200
MJ0909	05/31/01	1.01	200
MJ0910	05/31/01	1.01	200
MJ0911	05/31/01	1.02	200
MJ0912	05/31/01	1.01	200
MJ0913	05/31/01	1.00	200
MJ0914	05/31/01	1.01	200
MJ0915	05/31/01	1.01	200
MJ0916	05/31/01	1.01	200
MJ0917	05/31/01	1.02	200
MJ0918	05/31/01	1.00	200
MJ0919	05/31/01	1.02	200
MJ0920	05/31/01	1.00	200
MJ0920D	05/31/01	1.00	200
MJ0920S	05/31/01	1.00	200
MJ0921	05/31/01	1.00	200
MJ0922	05/31/01	1.02	200
MJ0923	05/31/01	1.00	200
MJ09E2	05/31/01	1.02	200
PBS	05/31/01	1.00	200

13
PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Method: CV

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	05/30/01	0.20	100
MJ0904	05/30/01	0.20	100
MJ0905	05/30/01	0.20	100
MJ0907	05/30/01	0.21	100
MJ0908	05/30/01	0.22	100
MJ0909	05/30/01	0.20	100
MJ0910	05/30/01	0.21	100
MJ0911	05/30/01	0.21	100
MJ0912	05/30/01	0.22	100
MJ0913	05/30/01	0.21	100
MJ0914	05/30/01	0.22	100
MJ0915	05/30/01	0.20	100
MJ0916	05/30/01	0.20	100
MJ0917	05/30/01	0.21	100
MJ0918	05/30/01	0.22	100
MJ0919	05/30/01	0.20	100
MJ0920	05/30/01	0.20	100
MJ0920D	05/30/01	0.20	100
MJ0920S	05/30/01	0.20	100
MJ0921	05/30/01	0.20	100
MJ0922	05/30/01	0.22	100
MJ0923	05/30/01	0.20	100
MJ09E2	05/30/01	0.21	100
PBS	05/30/01	0.20	100

CS018

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0904

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38052S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 87.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8180			P
7440-36-0	Antimony	1.7	B	~~J~~ JL	P
7440-38-2	Arsenic	7.8			P
7440-39-3	Barium	422			P
7440-41-7	Beryllium	0.43	B	JK	P
7440-43-9	Cadmium	4.9			P
7440-70-2	Calcium	12400			P
7440-47-3	Chromium	18.9			P
7440-48-4	Cobalt	5.4	B		P
7440-50-8	Copper	40.6		~~J~~ JL	P
7439-89-6	Iron	17400			P
7439-92-1	Lead	232			P
7439-95-4	Magnesium	8970			P
7439-96-5	Manganese	337			P
7439-97-6	Mercury	0.43			CV
7440-02-0	Nickel	16.6			P
7440-09-7	Potassium	1490			P
7782-49-2	Selenium	0.77	U		P
7440-22-4	Silver	0.78	B	JK	P
7440-23-5	Sodium	242	B	JK	P
7440-28-0	Thallium	0.89	U		P
7440-62-2	Vanadium	24.2			P
7440-66-6	Zinc	581			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01 6-226

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

CS019

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0905

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38053S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 35.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11900			P
7440-36-0	Antimony	2.1	B	~~N~~ JL	P
7440-38-2	Arsenic	4.5	B	JK	P
7440-39-3	Barium	231			P
7440-41-7	Beryllium	0.62	B	JK	P
7440-43-9	Cadmium	1.4	B	JK	P
7440-70-2	Calcium	9340			P
7440-47-3	Chromium	20.4			P
7440-48-4	Cobalt	7.4	B	JK	P
7440-50-8	Copper	41.8		~~N~~ JL	P
7439-89-6	Iron	20400			P
7439-92-1	Lead	64.9			P
7439-95-4	Magnesium	7000			P
7439-96-5	Manganese	392			P
7439-97-6	Mercury	0.14	U		CV
7440-02-0	Nickel	18.7	B	JK	P
7440-09-7	Potassium	2020	B	JK	P
7782-49-2	Selenium	1.9	U		P
7440-22-4	Silver	0.75	B	JK	P
7440-23-5	Sodium	480	B	JK	P
7440-28-0	Thallium	2.2	U		P
7440-62-2	Vanadium	26.7	B	JK	P
7440-66-6	Zinc	250			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

C5021

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0907

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL

Level (low/med): LOW

Lab Sample ID: 38187S

% Solids: 43.9

Date Received: 05/26/01

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12800			P
7440-36-0	Antimony	3.6	B	~~J~~ JL	P
7440-38-2	Arsenic	9.5			P
7440-39-3	Barium	364			P
7440-41-7	Beryllium	0.69	B	JK	P
7440-43-9	Cadmium	6.5			P
7440-70-2	Calcium	8230			P
7440-47-3	Chromium	33.1			P
7440-48-4	Cobalt	9.2	B	JK	P
7440-50-8	Copper	88.2		~~J~~ JL	P
7439-89-6	Iron	25200			P
7439-92-1	Lead	441			P
7439-95-4	Magnesium	8200			P
7439-96-5	Manganese	673			P
7439-97-6	Mercury	1.2			CV
7440-02-0	Nickel	25.9			P
7440-09-7	Potassium	2440			P
7782-49-2	Selenium	1.5	U		P
7440-22-4	Silver	2.0	B	JK	P
7440-23-5	Sodium	471	B	JK	P
7440-28-0	Thallium	1.8	U		P
7440-62-2	Vanadium	35.8			P
7440-66-6	Zinc	901			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

5

C5020

U.S. EPA - CLP
1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0908

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38054S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 35.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6670			P
7440-36-0	Antimony	5.4	B	~~N~~ JL	P
7440-38-2	Arsenic	6.8			P
7440-39-3	Barium	180			P
7440-41-7	Beryllium	0.39	B	JK	P
7440-43-9	Cadmium	1.8	B	JK	P
7440-70-2	Calcium	7630			P
7440-47-3	Chromium	17.0			P
7440-48-4	Cobalt	5.4	B	JK	P
7440-50-8	Copper	66.7		≠ JL	P
7439-89-6	Iron	15500			P
7439-92-1	Lead	72.7			P
7439-95-4	Magnesium	5610			P
7439-96-5	Manganese	303			P
7439-97-6	Mercury	0.13	U		CV
7440-02-0	Nickel	13.6	B	JK	P
7440-09-7	Potassium	1270	B	JK	P
7782-49-2	Selenium	1.9	U		P
7440-22-4	Silver	1.1	B	JK	P
7440-23-5	Sodium	426	B	JK	P
7440-28-0	Thallium	2.2	U		P
7440-62-2	Vanadium	20.2	B	JK	P
7440-66-6	Zinc	455			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5022

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0909

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38188S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 33.5

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11600			P
7440-36-0	Antimony	3.4	B	≠ JL	P
7440-38-2	Arsenic	10.3			P
7440-39-3	Barium	240			P
7440-41-7	Beryllium	0.60	B	JK	P
7440-43-9	Cadmium	5.9			P
7440-70-2	Calcium	7740			P
7440-47-3	Chromium	30.4			P
7440-48-4	Cobalt	7.9	B	JK	P
7440-50-8	Copper	67.6		≠ JL	P
7439-89-6	Iron	22400			P
7439-92-1	Lead	282			P
7439-95-4	Magnesium	7930			P
7439-96-5	Manganese	392			P
7439-97-6	Mercury	0.90			CV
7440-02-0	Nickel	23.2	B	JK	P
7440-09-7	Potassium	2280	B	JK	P
7782-49-2	Selenium	2.0	U		P
7440-22-4	Silver	1.5	B	JK	P
7440-23-5	Sodium	623	B	JK	P
7440-28-0	Thallium	2.3	U		P
7440-62-2	Vanadium	33.7			P
7440-66-6	Zinc	617			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

1

C5023

U.S. EPA - CLP
1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0910

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38189S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 99.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10400			P
7440-36-0	Antimony	1.0	B	~~N~~ JL	P
7440-38-2	Arsenic	4.2			P
7440-39-3	Barium	190			P
7440-41-7	Beryllium	0.63	B	JL	P
7440-43-9	Cadmium	1.6			P
7440-70-2	Calcium	5470			P
7440-47-3	Chromium	25.7			P
7440-48-4	Cobalt	8.2	B	JL	P
7440-50-8	Copper	53.9		~~E~~ JL	P
7439-89-6	Iron	18000			P
7439-92-1	Lead	93.8			P
7439-95-4	Magnesium	6150			P
7439-96-5	Manganese	392			P
7439-97-6	Mercury	0.25			CV
7440-02-0	Nickel	23.0			P
7440-09-7	Potassium	2390			P
7782-49-2	Selenium	0.68	U		P
7440-22-4	Silver	0.98	B	JL	P
7440-23-5	Sodium	186	B	JL	P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	32.1			P
7440-66-6	Zinc	280			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS025

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0911

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38190S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 36.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9920			P
7440-36-0	Antimony	4.9	B	~~J~~ JL	P
7440-38-2	Arsenic	10.6			P
7440-39-3	Barium	505			P
7440-41-7	Beryllium	0.54	B	JK	P
7440-43-9	Cadmium	4.3			P
7440-70-2	Calcium	21200			P
7440-47-3	Chromium	25.0			P
7440-48-4	Cobalt	7.9	B	JK	P
7440-50-8	Copper	120		~~J~~ JL	P
7439-89-6	Iron	27500			P
7439-92-1	Lead	211			P
7439-95-4	Magnesium	13800			P
7439-96-5	Manganese	528			P
7439-97-6	Mercury	0.49			CV
7440-02-0	Nickel	21.4			P
7440-09-7	Potassium	1960	B	JK	P
7782-49-2	Selenium	1.8	U		P
7440-22-4	Silver	2.0	B	JK	P
7440-23-5	Sodium	483	B	JK	P
7440-28-0	Thallium	2.1	U		P
7440-62-2	Vanadium	30.5			P
7440-66-6	Zinc	855			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5027

U.S. EPA - CLP
1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0912

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38191S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 49.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9090			P
7440-36-0	Antimony	1.3	B	~~N~~ JL	P
7440-38-2	Arsenic	3.4	B	JK	P
7440-39-3	Barium	113			P
7440-41-7	Beryllium	0.58	B	JK	P
7440-43-9	Cadmium	0.29	B	JK	P
7440-70-2	Calcium	4800			P
7440-47-3	Chromium	21.1			P
7440-48-4	Cobalt	6.0	B	JK	P
7440-50-8	Copper	25.0		~~E~~ JL	P
7439-89-6	Iron	16000			P
7439-92-1	Lead	21.3			P
7439-95-4	Magnesium	5190			P
7439-96-5	Manganese	284			P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	16.2			P
7440-09-7	Potassium	1380	B	JK	P
7782-49-2	Selenium	1.3	U		P
7440-22-4	Silver	0.52	B	JK	P
7440-23-5	Sodium	385	B	JK	P
7440-28-0	Thallium	1.5	U		P
7440-62-2	Vanadium	29.0			P
7440-66-6	Zinc	104			P
	Cyanide				NR

B

FEB 04 2002

JP 6-26-01

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

FORM I - IN ILM04.1

10

CS028

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0913

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38192S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 42.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12400			P
7440-36-0	Antimony	3.9	B	~~J~~ JL	P
7440-38-2	Arsenic	9.7			P
7440-39-3	Barium	370			P
7440-41-7	Beryllium	0.67	B	JK	P
7440-43-9	Cadmium	2.8			P
7440-70-2	Calcium	16100			P
7440-47-3	Chromium	30.1			P
7440-48-4	Cobalt	9.6	B	JK	P
7440-50-8	Copper	114		~~J~~ JL	P
7439-89-6	Iron	29000			P
7439-92-1	Lead	149			P
7439-95-4	Magnesium	11900			P
7439-96-5	Manganese	589			P
7439-97-6	Mercury	0.17	B	JK	CV
7440-02-0	Nickel	24.8			P
7440-09-7	Potassium	2480			P
7782-49-2	Selenium	1.6	U		P
7440-22-4	Silver	1.7	B	JK	P
7440-23-5	Sodium	397	B	JK	P
7440-28-0	Thallium	1.9	U		P
7440-62-2	Vanadium	36.7			P
7440-66-6	Zinc	787			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

C5026

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0914

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38193S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 55.5

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8000			P
7440-36-0	Antimony	4.8	B	~~N~~ JL	P
7440-38-2	Arsenic	9.5			P
7440-39-3	Barium	375			P
7440-41-7	Beryllium	0.44	B	JL	P
7440-43-9	Cadmium	2.9			P
7440-70-2	Calcium	16600			P
7440-47-3	Chromium	21.9			P
7440-48-4	Cobalt	7.7	B	JK	P
7440-50-8	Copper	118		~~N~~ JL	P
7439-89-6	Iron	23000			P
7439-92-1	Lead	159			P
7439-95-4	Magnesium	11100			P
7439-96-5	Manganese	411			P
7439-97-6	Mercury	0.20			CV
7440-02-0	Nickel	18.0			P
7440-09-7	Potassium	1560	B	JK	P
7782-49-2	Selenium	1.2	U		P
7440-22-4	Silver	1.8	B	JK	P
7440-23-5	Sodium	354	B	JK	P
7440-28-0	Thallium	1.4	U		P
7440-62-2	Vanadium	25.6			P
7440-66-6	Zinc	940			P
	Cyanide				NR

B

FEB 0 4 2002

CP 6-26-01

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5029

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0915

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38194S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 98.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7150			P
7440-36-0	Antimony	1.9	B	~~N~~ JL	P
7440-38-2	Arsenic	7.0			P
7440-39-3	Barium	342			P
7440-41-7	Beryllium	0.37	B	JK	P
7440-43-9	Cadmium	3.2			P
7440-70-2	Calcium	11500			P
7440-47-3	Chromium	17.7			P
7440-48-4	Cobalt	5.0	B	JK	P
7440-50-8	Copper	65.7		~~N~~ JL	P
7439-89-6	Iron	15900			P
7439-92-1	Lead	208			P
7439-95-4	Magnesium	7940			P
7439-96-5	Manganese	256			P
7439-97-6	Mercury	0.53			CV
7440-02-0	Nickel	14.1			P
7440-09-7	Potassium	1250			P
7782-49-2	Selenium	0.68	U		P
7440-22-4	Silver	1.5	B	JK	P
7440-23-5	Sodium	200	B	JK	P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	21.4			P
7440-66-6	Zinc	600			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS030

U.S. EPA - CLP
1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0916

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38195S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 96.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11200			P
7440-36-0	Antimony	4.7	B	~~N~~ JL	P
7440-38-2	Arsenic	11.1			P
7440-39-3	Barium	624			P
7440-41-7	Beryllium	0.62	B	JL	P
7440-43-9	Cadmium	7.2			P
7440-70-2	Calcium	20500			P
7440-47-3	Chromium	30.6			P
7440-48-4	Cobalt	9.0	B	JL	P
7440-50-8	Copper	205		≠ JL	P
7439-89-6	Iron	26800			P
7439-92-1	Lead	369			P
7439-95-4	Magnesium	14200			P
7439-96-5	Manganese	388			P
7439-97-6	Mercury	1.1			CV
7440-02-0	Nickel	23.1			P
7440-09-7	Potassium	1820			P
7782-49-2	Selenium	1.1			P
7440-22-4	Silver	3.1			P
7440-23-5	Sodium	258	B	JL	P
7440-28-0	Thallium	0.80	U		P
7440-62-2	Vanadium	33.1			P
7440-66-6	Zinc	1250			P
	Cyanide				NR

B
FEB 04 2002

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5031

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0917

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38196S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 60.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6940			P
7440-36-0	Antimony	21.5		# JL	P
7440-38-2	Arsenic	11.5			P
7440-39-3	Barium	533			P
7440-41-7	Beryllium	0.38	B	JK	P
7440-43-9	Cadmium	4.3			P
7440-70-2	Calcium	26300			P
7440-47-3	Chromium	29.9			P
7440-48-4	Cobalt	10.7	B	JK	P
7440-50-8	Copper	387		# JL	P
7439-89-6	Iron	36300			P
7439-92-1	Lead	256			P
7439-95-4	Magnesium	11800			P
7439-96-5	Manganese	661			P
7439-97-6	Mercury	0.40			CV
7440-02-0	Nickel	16.0			P
7440-09-7	Potassium	1440	B	JK	P
7782-49-2	Selenium	1.6	B	JK	P
7440-22-4	Silver	3.4			P
7440-23-5	Sodium	374	B	JK	P
7440-28-0	Thallium	1.6	B	JK	P
7440-62-2	Vanadium	23.6			P
7440-66-6	Zinc	2560			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: GREY Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS032

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0918

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38197S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 93.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9410			P
7440-36-0	Antimony	4.7	B	~~J~~ JL	P
7440-38-2	Arsenic	8.7			P
7440-39-3	Barium	295			P
7440-41-7	Beryllium	0.54	B	JK	P
7440-43-9	Cadmium	3.5			P
7440-70-2	Calcium	15400			P
7440-47-3	Chromium	26.4			P
7440-48-4	Cobalt	8.6	B	JK	P
7440-50-8	Copper	150		~~J~~ JL	P
7439-89-6	Iron	24700			P
7439-92-1	Lead	165			P
7439-95-4	Magnesium	10200			P
7439-96-5	Manganese	481			P
7439-97-6	Mercury	0.19			CV
7440-02-0	Nickel	21.1			P
7440-09-7	Potassium	1900			P
7782-49-2	Selenium	0.97	B	JK	P
7440-22-4	Silver	2.1	B	JK	P
7440-23-5	Sodium	266	B	JK	P
7440-28-0	Thallium	0.84	U		P
7440-62-2	Vanadium	29.4			P
7440-66-6	Zinc	1030			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS033

U.S. EPA - CLP
1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0919

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38198S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 83.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9240			P
7440-36-0	Antimony	7.0	B	N JL	P
7440-38-2	Arsenic	13.0			P
7440-39-3	Barium	618			P
7440-41-7	Beryllium	0.51	B	JL	P
7440-43-9	Cadmium	6.9			P
7440-70-2	Calcium	26100			P
7440-47-3	Chromium	29.4			P
7440-48-4	Cobalt	9.0	B	JL	P
7440-50-8	Copper	251		N JL	P
7439-89-6	Iron	28900			P
7439-92-1	Lead	392			P
7439-95-4	Magnesium	15300			P
7439-96-5	Manganese	435			P
7439-97-6	Mercury	0.73			CV
7440-02-0	Nickel	20.9			P
7440-09-7	Potassium	1620			P
7782-49-2	Selenium	1.2			P
7440-22-4	Silver	3.2			P
7440-23-5	Sodium	269	B	JL	P
7440-28-0	Thallium	0.92	U		P
7440-62-2	Vanadium	30.2			P
7440-66-6	Zinc	1660			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS035

U.S. EPA - CLP
1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0920

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38199S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 99.5

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8540			P
7440-36-0	Antimony	2.2	B	N JL	P
7440-38-2	Arsenic	7.9			P
7440-39-3	Barium	255			P
7440-41-7	Beryllium	0.45	B	JK	P
7440-43-9	Cadmium	2.3			P
7440-70-2	Calcium	10800			P
7440-47-3	Chromium	23.4			P
7440-48-4	Cobalt	7.3	B	JK	P
7440-50-8	Copper	76.8		N JL	P
7439-89-6	Iron	19800			P
7439-92-1	Lead	112			P
7439-95-4	Magnesium	8570			P
7439-96-5	Manganese	467			P
7439-97-6	Mercury	0.16			CV
7440-02-0	Nickel	19.1			P
7440-09-7	Potassium	1610			P
7782-49-2	Selenium	0.68	U		P
7440-22-4	Silver	1.2	B	JK	P
7440-23-5	Sodium	237	B	JK	P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	28.3			P
7440-66-6	Zinc	592			P
	Cyanide				NR

B

FEB 0 4 2002

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS034

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0921

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38200S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 98.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8720			P
7440-36-0	Antimony	5.7	B	≠ JL	P
7440-38-2	Arsenic	10.7			P
7440-39-3	Barium	391			P
7440-41-7	Beryllium	0.49	B	JK	P
7440-43-9	Cadmium	3.6			P
7440-70-2	Calcium	19600			P
7440-47-3	Chromium	25.8			P
7440-48-4	Cobalt	8.6	B		P
7440-50-8	Copper	156		≠ JL	P
7439-89-6	Iron	25500			P
7439-92-1	Lead	190			P
7439-95-4	Magnesium	12800			P
7439-96-5	Manganese	545			P
7439-97-6	Mercury	0.32			CV
7440-02-0	Nickel	19.8			P
7440-09-7	Potassium	1760			P
7782-49-2	Selenium	0.69	U		P
7440-22-4	Silver	2.2			P
7440-23-5	Sodium	207	B	JK	P
7440-28-0	Thallium	0.79	U		P
7440-62-2	Vanadium	28.6			P
7440-66-6	Zinc	1100			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS036

EPA SAMPLE NO.

MJ0922

INORGANIC ANALYSIS DATA SHEET

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38201S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 96.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8790			P
7440-36-0	Antimony	10.8	B	~~N~~ JL	P
7440-38-2	Arsenic	10.4			P
7440-39-3	Barium	438			P
7440-41-7	Beryllium	0.39	B	JK	P
7440-43-9	Cadmium	2.8			P
7440-70-2	Calcium	22300			P
7440-47-3	Chromium	28.1			P
7440-48-4	Cobalt	10.6			P
7440-50-8	Copper	309		~~N~~ JL	P
7439-89-6	Iron	42300			P
7439-92-1	Lead	209			P
7439-95-4	Magnesium	10300			P
7439-96-5	Manganese	946			P
7439-97-6	Mercury	0.16			CV
7440-02-0	Nickel	15.0			P
7440-09-7	Potassium	1400			P
7782-49-2	Selenium	1.4			P
7440-22-4	Silver	2.1			P
7440-23-5	Sodium	384	B	JK	P
7440-28-0	Thallium	0.81	B	JK	P
7440-62-2	Vanadium	27.1			P
7440-66-6	Zinc	3090			P
	Cyanide				NR

B

FEB 0 4 2002

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS037

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0923

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38202S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 99.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	18900			P
7440-36-0	Antimony	17.2		N JL	P
7440-38-2	Arsenic	26.9			P
7440-39-3	Barium	1070			P
7440-41-7	Beryllium	0.74	B	JK	P
7440-43-9	Cadmium	2.8			P
7440-70-2	Calcium	49600			P
7440-47-3	Chromium	59.1			P
7440-48-4	Cobalt	22.3			P
7440-50-8	Copper	1460		N JL	P
7439-89-6	Iron	176000			P
7439-92-1	Lead	1590			P
7439-95-4	Magnesium	7230			P
7439-96-5	Manganese	3390			P
7439-97-6	Mercury	0.07	B	JK	CV
7440-02-0	Nickel	10.3			P
7440-09-7	Potassium	3620			P
7782-49-2	Selenium	0.68	U		P
7440-22-4	Silver	4.0			P
7440-23-5	Sodium	1310			P
7440-28-0	Thallium	4.0			P
7440-62-2	Vanadium	39.0			P
7440-66-6	Zinc	24900			P
	Cyanide				NR

B

FEB 04 2002

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5017
18-24"

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ09E2

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0904

Matrix (soil/water): SOIL Lab Sample ID: 38055S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 81.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15600			P
7440-36-0	Antimony	0.72	U	#UJK	P
7440-38-2	Arsenic	2.8			P
7440-39-3	Barium	175			P
7440-41-7	Beryllium	0.55	B		P
7440-43-9	Cadmium	0.43	B		P
7440-70-2	Calcium	5560			P
7440-47-3	Chromium	9.4			P
7440-48-4	Cobalt	4.0	B		P
7440-50-8	Copper	15.6		# JL	P
7439-89-6	Iron	11500			P
7439-92-1	Lead	26.8			P
7439-95-4	Magnesium	2970			P
7439-96-5	Manganese	315			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	9.2	B		P
7440-09-7	Potassium	1060	B		P
7782-49-2	Selenium	0.82	U		P
7440-22-4	Silver	0.32	B		P
7440-23-5	Sodium	381	B		P
7440-28-0	Thallium	0.94	U		P
7440-62-2	Vanadium	19.2			P
7440-66-6	Zinc	84.2			P
_____	Cyanide				NR

JL 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

ENVIRONMENTAL SERVICES ASSISTANCE TEAM

ESAT Region 10
7411 Beach Drive East
Port Orchard, WA 98366
Phone (360) 871-8723

received 8-6-01

DELIVERABLE NARRATIVE

DATE: June 27, 2001

To: Ginna Grepo-Grove, TOPO, USEPA, Region 10

THROUGH: Dave Dobb, Team Manager, ESAT Region 10

FROM: Chris Pace, Data Validation Task Lead, ESAT Region 10

SUBJECT: Data Validation Report for the Inorganic Analysis of Samples from the Upper Columbia River Lake Roosevelt site. Case: 29276 SDG: MJ08Y3

Account Code: 01T10P50102D106XLA00

Doc. #: ES10-0-1069
TDN: 1035
Task Order: 001
Contract: 68-W-01-027

CC: Gerald Dodo, PO, USEPA, Region 10
Project File

The quality assurance (QA) review of 3 water and 17 soil samples collected from the above referenced site has been completed. These samples were analyzed for total metals by Sentinel, Inc. of Huntsville, AL. The following samples were reviewed in this validation report:

MJ08Y3	MJ08Y9	MJ08Z4	MJ08Z9
MJ08Y4	MJ08Z0	MJ08Z5	MJ0900
MJ08Y5	MJ08Z1	MJ08Z6	MJ0901
MJ08Y6	MJ08Z2	MJ08Z7	MJ0902
MJ08Y8	MJ08Z3	MJ08Z8	MJ0903

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in the Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganic Analysis (ILM04.1) and the USEPA CLP Functional Guidelines for Inorganic Data Review, 2/94.

The conclusions presented herein are based on the information provided for the review.

Holding Time

The suggested holding time for mercury is 28 days from the date of sample collection and the holding time for the rest of the metals is 180 days. The soil samples were collected on 5/14, 5/15, 5/17 and 5/18/01. The soil samples were analyzed for mercury within 10 days and all other metals within 10 days of the sample collection date.

Water samples MJ08Y3, MJ08Y4 and MJ08Y5 did not meet the preservation requirement of pH < 2. The laboratory adjusted the pH prior to sample preparation.

The chain of custody did not contain the sample collection date for water samples MJ08Y3, MJ08Y4 and MJ08Y5. The water samples were received on 5/16/01 and analyzed for mercury within 7 days and all other metals within 8 days. Holding time criteria for the water samples utilizing the sample collection date could not be evaluated.

None of the data were qualified based on holding time.

Sample Preparation - Acceptable

The samples were prepared in accordance with the methods used. None of the data were qualified on this basis.

Initial Calibration - Acceptable

All of the samples were analyzed for total mercury using Cold Vapor Atomic Absorption Spectroscopy (CVAAS). The initial calibration for mercury met the frequency of analysis and the linearity criteria (correlation coefficients, r=>0.995).

The rest of the target analytes were analyzed using Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES). The initial calibration for ICP-AES met the frequency of analysis and the linearity criteria (correlation coefficients, r=>0.995).

None of the data were qualified on this basis.

Calibration Verification - Acceptable

The initial and continuing calibration verifications met the criteria for frequency of analysis and recovery criteria of 90-110% and 80-120% for mercury. The recoveries ranged from 94-109% for ICP-AES and from 82-100% for mercury. None of the data were qualified on this basis.

Detection Limits - Acceptable

All of the target analytes met the project required quantitation limits. All of the Contract Required Detection Limit (CRDL) checks met the frequency of analysis and recovery criteria.

Blanks

Procedural blanks were prepared with the samples to indicate potential contamination from the digestion or analytical procedure. If an analyte was found in the associated blank, the sample results were qualified as non-detects, "U", if the analyte concentration is less than five times the analytical value in the blank.

The frequency of analysis of blanks was met. Based on the target analytes detected in the procedural, initial and continuing calibration blanks, the following results were qualified as non-detects, "U":

Analyte	Associated Samples
arsenic	MJ08Y6, MJ08Y9, MJ08Z0, MJ08Z1, MJ08Z2, MJ08Z3, MJ08Z4
zinc	MJ08Y5

Analytes which yielded a negative response in the preparation blank and/or continuing calibration blank(s) at concentrations comparable to or less than the absolute value of the blank(s) were qualified as estimated, "J/UJ", due to possible low bias. The following samples were qualified:

Analyte	Associated Samples
copper	MJ08Y3, MJ08Y4, MJ08Y5

ICP-AES Interference Check Sample - Acceptable

The ICP-AES interference check samples (ICS) were analyzed to verify inter-element and background correction factors. The frequency of analysis (beginning and end of sequence) and recovery criteria (80-120%) were met by all of the ICS analyzed. The recoveries ranged from 89-108%. None of the data were qualified on this basis.

ICP-AES Serial Dilution Analysis

Samples MJ08Y3 (water) and MJ0900 (soil) were analyzed for serial dilution. All of the analytes which exceeded the minimum concentration criterion (50 times the IDL) agreed within 10% difference with the exception of potassium in sample MJ08Y3 and calcium, copper, magnesium and potassium in sample MJ0900. Calcium and magnesium only slightly exceeded the 10% difference criteria and therefore, were not qualified on this basis. Results for copper and potassium in the associated samples were qualified as estimated, "J". The "E" qualifiers applied by the laboratory were crossed-out by the reviewer.

Laboratory Control Sample - Acceptable

The frequency of analysis and the recovery criteria for the laboratory control samples were met. The aqueous recoveries ranged from 89-107% and the soil recoveries ranged from 58-108%. None of the data were qualified on this basis.

Duplicate Sample Analysis - Acceptable

Samples MJ08Y3 (water) and MJ0900 (soil) were utilized for duplicate analysis. The duplicate results met the frequency of analysis and control limit criteria for all target analytes. None of the data were qualified on this basis.

Matrix Spike Analysis

Samples MJ08Y3 (water) and MJ0900 (soil) were used for the spike analysis. The frequency of analysis and recovery criteria were met with the exception of antimony (55%) in the spike sample MJ0900S. Due to possible bias, the detected and non-detected antimony results in the associated samples were qualified as estimated, "J/UJ". The "N" qualifiers applied by the laboratory were crossed-out by the reviewer. The recoveries for lead and zinc in sample MJ0900S could not be accurately determined because the concentrations native to the sample were greater than 4 times the amount of spike added to the sample. All of the other spike recoveries were acceptable and ranged from 80-112% in sample MJ0Y3S and 88-111% in sample MJ0900S.

Laboratory Contact

The laboratory was not contacted for this review.

Overall Assessment

The total number of data points was 460. Three (1.7%) were qualified as non-detects due to blank contamination. Fifty seven (12.4%) were qualified as estimated due to negative blank contamination, spike analysis and ICP serial dilution.

All of the samples were analyzed in accordance with technical specifications outlined in the SOW. The data, as qualified, are acceptable and can be used for all purposes.

DATA QUALIFIERS

U	-	The analyte was not detected at or above the reported result.
J	-	The analyte was positively identified. The associated numerical result is an estimate.
R	-	The data are unusable for all purposes.
N	-	There is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result. The associated numerical value is an estimate of the quantitation limit of the analyte in this sample.
L	-	Low bias.
H	-	High bias.
Q	-	The result is estimated because the concentration is below the Contract Required Quantitation Limits (CRQLs).
K	-	Unknown Bias.

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

ICP ID Number: P4 Date: 04/15/01

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	168.1	P
Antimony	206.80		60	3.0	P
Arsenic	189.00		10	4.0	P
Barium	493.40		200	1.7	P
Beryllium	313.00		5	0.2	P
Cadmium	226.50		5	0.3	P
Calcium	317.90		5000	136.5	P
Chromium	267.70		10	0.7	P
Cobalt	228.60		50	1.1	P
Copper	324.70		25	0.7	P
Iron	271.40		100	54.6	P
Lead	220.30		3	1.5	P
Magnesium	279.00		5000	132.2	P
Manganese	257.60		15	0.4	P
Mercury			0.2		NR
Nickel	231.60		40	1.5	P
Potassium	766.40		5000	15.4	P
Selenium	196.00		5	3.4	P
Silver	328.00		10	0.8	P
Sodium	330.20		5000	130.9	P
Thallium	190.80		10	3.9	P
Vanadium	292.40		50	0.9	P
Zinc	206.20		20	0.8	P
Cyanide			10		NR

Comments:

P4: THERMO JARRELL ASH

U.S. EPA - CLP

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

ICP ID Number: Date: 04/15/01

Flame AA ID Number: C5

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.1	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR
Cyanide			10		NR

Comments:

C5: CETAC M6000

13
PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Method: P

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	05/23/01	1.00	200
LCSW	05/23/01		100
MJ08Y3	05/23/01		100
MJ08Y3D	05/23/01		100
MJ08Y3S	05/23/01		100
MJ08Y4	05/23/01		100
MJ08Y5	05/23/01		100
MJ08Y6	05/23/01	1.01	200
MJ08Y8	05/23/01	1.01	200
MJ08Y9	05/23/01	1.00	200
MJ08Z0	05/23/01	1.02	200
MJ08Z1	05/23/01	1.00	200
MJ08Z2	05/23/01	1.00	200
MJ08Z3	05/23/01	1.02	200
MJ08Z4	05/23/01	1.01	200
MJ08Z5	05/23/01	1.02	200
MJ08Z6	05/23/01	1.01	200
MJ08Z7	05/23/01	1.02	200
MJ08Z8	05/23/01	1.00	200
MJ08Z9	05/23/01	1.02	200
MJ0900	05/23/01	1.00	200
MJ0900D	05/23/01	1.00	200
MJ0900S	05/23/01	1.00	200
MJ0901	05/23/01	1.01	200
MJ0902	05/23/01	1.02	200
MJ0903	05/23/01	1.01	200
PBS	05/23/01	1.00	200
PBW	05/23/01		100

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PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-0C-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Method: CV

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	05/23/01	0.20	100
MJ08Y3	05/23/01		100
MJ08Y3D	05/23/01		100
MJ08Y3S	05/23/01		100
MJ08Y4	05/23/01		100
MJ08Y5	05/23/01		100
MJ08Y6	05/23/01	0.21	100
MJ08Y8	05/23/01	0.20	100
MJ08Y9	05/23/01	0.22	100
MJ08Z0	05/23/01	0.21	100
MJ08Z1	05/23/01	0.22	100
MJ08Z2	05/23/01	0.20	100
MJ08Z3	05/23/01	0.22	100
MJ08Z4	05/23/01	0.21	100
MJ08Z5	05/23/01	0.22	100
MJ08Z6	05/23/01	0.20	100
MJ08Z7	05/23/01	0.21	100
MJ08Z8	05/23/01	0.20	100
MJ08Z9	05/23/01	0.21	100
MJ0901	05/23/01	0.21	100
MJ0902	05/23/01	0.22	100
MJ0903	05/23/01	0.21	100
PBS	05/23/01	0.20	100
PBW	05/23/01		100

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PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Method: CV

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	05/24/01	0.20	100
MJ0900	05/24/01	0.20	100
MJ0900D	05/24/01	0.20	100
MJ0900S	05/24/01	0.20	100
PBS	05/24/01	0.20	100

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ08Y3

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): WATER Lab Sample ID: 37914S

Level (low/med): LOW Date Received: 05/16/01

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	168	U		P
7440-36-0	Antimony	3.0	U		P
7440-38-2	Arsenic	4.0	U		P
7440-39-3	Barium	31.0	B	JK	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	21400			P
7440-47-3	Chromium	0.70	U		P
7440-48-4	Cobalt	1.1	U		P
7440-50-8	Copper	1.4	B	JL	P
7439-89-6	Iron	54.6	U		P
7439-92-1	Lead	1.5	U		P
7439-95-4	Magnesium	5330			P
7439-96-5	Manganese	4.3	B	JK	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.5	U		P
7440-09-7	Potassium	1020	B	≠ J	P
7782-49-2	Selenium	3.4	U		P
7440-22-4	Silver	0.80	U		P
7440-23-5	Sodium	4470	B	JK	P
7440-28-0	Thallium	3.9	U		P
7440-62-2	Vanadium	0.90	U		P
7440-66-6	Zinc	8.7	B	JK	P
	Cyanide				NR

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FEB 04 2002

6-25-01

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ08Y4

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): WATER Lab Sample ID: 37915S

Level (low/med): LOW Date Received: 05/16/01

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	168	U		P
7440-36-0	Antimony	3.0	U		P
7440-38-2	Arsenic	4.0	U		P
7440-39-3	Barium	31.8	B	JK	P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	21500			P
7440-47-3	Chromium	0.70	U		P
7440-48-4	Cobalt	1.1	U		P
7440-50-8	Copper	0.97	B	JL	P
7439-89-6	Iron	54.6	U		P
7439-92-1	Lead	1.5	U		P
7439-95-4	Magnesium	5360			P
7439-96-5	Manganese	3.6	B	JK	P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.5	U		P
7440-09-7	Potassium	994	B	J	P
7782-49-2	Selenium	3.4	U		P
7440-22-4	Silver	0.80	U		P
7440-23-5	Sodium	2600	B	JK	P
7440-28-0	Thallium	3.9	U		P
7440-62-2	Vanadium	0.90	U		P
7440-66-6	Zinc	5.9	B	JK	P
	Cyanide				NR

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FEB 04 2002

CP 6-25-01

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ08Y5

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): WATER Lab Sample ID: 37916S

Level (low/med): LOW Date Received: 05/16/01

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	168	U		P
7440-36-0	Antimony	3.0	U		P
7440-38-2	Arsenic	4.0	U		P
7440-39-3	Barium	1.7	U		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	136	U		P
7440-47-3	Chromium	0.70	U		P
7440-48-4	Cobalt	1.1	U		P
7440-50-8	Copper	0.70	U	UJK	P
7439-89-6	Iron	54.6	U		P
7439-92-1	Lead	1.5	U		P
7439-95-4	Magnesium	132	U		P
7439-96-5	Manganese	0.40	U		P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	1.5	U		P
7440-09-7	Potassium	99.5	B	≠ JK	P
7782-49-2	Selenium	3.4	U		P
7440-22-4	Silver	0.80	U		P
7440-23-5	Sodium	660	B	JK	P
7440-28-0	Thallium	3.9	U		P
7440-62-2	Vanadium	0.90	U		P
7440-66-6	Zinc	2.1	U	U	P
	Cyanide				NR

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FEB 04 2002

6-25-01

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ08Y6

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38035S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 80.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6270			P
7440-36-0	Antimony	0.74	U	UJK	P
7440-38-2	Arsenic	4.5		U	P
7440-39-3	Barium	79.6			P
7440-41-7	Beryllium	0.45	B	JK	P
7440-43-9	Cadmium	0.62	B	JK	P
7440-70-2	Calcium	3090		J	P
7440-47-3	Chromium	7.7			P
7440-48-4	Cobalt	5.2	B	JK	P
7440-50-8	Copper	9.8		J JL	P
7439-89-6	Iron	16700			P
7439-92-1	Lead	22.3			P
7439-95-4	Magnesium	3460		J	P
7439-96-5	Manganese	434			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	8.0	B	JK	P
7440-09-7	Potassium	1250		J JL	P
7782-49-2	Selenium	0.84	U		P
7440-22-4	Silver	0.80	B	JK	P
7440-23-5	Sodium	184	B	JK	P
7440-28-0	Thallium	0.97	U		P
7440-62-2	Vanadium	30.0			P
7440-66-6	Zinc	149			P
	Cyanide				NR

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FEB 04 2002

6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ08Y8

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38036S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 77.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11300			P
7440-36-0	Antimony	1.3	B	~~N~~ JL	P
7440-38-2	Arsenic	6.7			P
7440-39-3	Barium	136			P
7440-41-7	Beryllium	0.66	B	JL	P
7440-43-9	Cadmium	0.08	U		P
7440-70-2	Calcium	7150		~~E~~	P
7440-47-3	Chromium	16.4			P
7440-48-4	Cobalt	8.4	B	JL	P
7440-50-8	Copper	17.3		~~E~~ JL	P
7439-89-6	Iron	22900			P
7439-92-1	Lead	11.4			P
7439-95-4	Magnesium	6540		~~E~~	P
7439-96-5	Manganese	475			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	15.6			P
7440-09-7	Potassium	2470		~~E~~ JL	P
7782-49-2	Selenium	0.87	U		P
7440-22-4	Silver	1.2	B	JL	P
7440-23-5	Sodium	259	B	JL	P
7440-28-0	Thallium	1.0	U		P
7440-62-2	Vanadium	36.1			P
7440-66-6	Zinc	77.9			P
	Cyanide				NR

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FEB 04 2002

CP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ08Y9

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38037S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 74.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8730			P
7440-36-0	Antimony	0.81	B	~~N~~ JL	P
7440-38-2	Arsenic	4.0		U	P
7440-39-3	Barium	113			P
7440-41-7	Beryllium	0.71	B	JK	P
7440-43-9	Cadmium	0.08	U		P
7440-70-2	Calcium	5760		~~E~~	P
7440-47-3	Chromium	8.8			P
7440-48-4	Cobalt	7.2	B	JK	P
7440-50-8	Copper	11.1		~~E~~ JL	P
7439-89-6	Iron	23000			P
7439-92-1	Lead	6.1			P
7439-95-4	Magnesium	4340		~~E~~	P
7439-96-5	Manganese	387			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	8.5	B	JK	P
7440-09-7	Potassium	1840		~~E~~ JL	P
7782-49-2	Selenium	0.91	U		P
7440-22-4	Silver	1.0	B	JK	P
7440-23-5	Sodium	532	B	JK	P
7440-28-0	Thallium	1.0	U		P
7440-62-2	Vanadium	51.3			P
7440-66-6	Zinc	54.3			P
	Cyanide				NR

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FEB 04 2002

CP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS004

U.S. EPA - CLP

1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ08Z0

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38038S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 51.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13700			P
7440-36-0	Antimony	1.5	B	~~N~~ J L	P
7440-38-2	Arsenic	7.7		U	P
7440-39-3	Barium	230			P
7440-41-7	Beryllium	0.69	B	J K	P
7440-43-9	Cadmium	3.6			P
7440-70-2	Calcium	5970		E	P
7440-47-3	Chromium	30.1			P
7440-48-4	Cobalt	8.5	B	J K	P
7440-50-8	Copper	48.5		E J L	P
7439-89-6	Iron	23400			P
7439-92-1	Lead	219			P
7439-95-4	Magnesium	6990		E	P
7439-96-5	Manganese	719			P
7439-97-6	Mercury	0.66			CV
7440-02-0	Nickel	24.6			P
7440-09-7	Potassium	2570		E J L	P
7782-49-2	Selenium	1.3	U		P
7440-22-4	Silver	1.7	B	J K	P
7440-23-5	Sodium	345	B	J K	P
7440-28-0	Thallium	1.5	U		P
7440-62-2	Vanadium	36.9			P
7440-66-6	Zinc	523			P
	Cyanide				NR

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FEB 04 2002

CP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ08Z1

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38039S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 57.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12100			P
7440-36-0	Antimony	1.6	B	N J L	P
7440-38-2	Arsenic	8.1		U	P
7440-39-3	Barium	269			P
7440-41-7	Beryllium	0.63	B	J K	P
7440-43-9	Cadmium	4.0			P
7440-70-2	Calcium	7670		E	P
7440-47-3	Chromium	29.8			P
7440-48-4	Cobalt	8.1	B	J K	P
7440-50-8	Copper	41.6		E J L	P
7439-89-6	Iron	22300			P
7439-92-1	Lead	238			P
7439-95-4	Magnesium	7720		E	P
7439-96-5	Manganese	533			P
7439-97-6	Mercury	0.49			CV
7440-02-0	Nickel	24.1			P
7440-09-7	Potassium	2230		E J L	P
7782-49-2	Selenium	1.2	U		P
7440-22-4	Silver	1.6	B	J K	P
7440-23-5	Sodium	359	B	J K	P
7440-28-0	Thallium	1.4	U		P
7440-62-2	Vanadium	36.2			P
7440-66-6	Zinc	600			P
	Cyanide				NR

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FEB 04 2002

OP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

11

CS006

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ08Z2

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38040S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 78.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4430			P
7440-36-0	Antimony	0.76	U	~~N~~ 4 JK	P
7440-38-2	Arsenic	2.2	~~B~~ U		P
7440-39-3	Barium	42.2	B	JK	P
7440-41-7	Beryllium	0.21	B	JK	P
7440-43-9	Cadmium	0.12	B	JK	P
7440-70-2	Calcium	4420		~~E~~	P
7440-47-3	Chromium	8.8			P
7440-48-4	Cobalt	3.3	B	JK	P
7440-50-8	Copper	10.4		~~E~~ JL	P
7439-89-6	Iron	8630			P
7439-92-1	Lead	6.2			P
7439-95-4	Magnesium	3140		~~E~~	P
7439-96-5	Manganese	181			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	9.6	B	JK	P
7440-09-7	Potassium	763	B	~~E~~ JL	P
7782-49-2	Selenium	0.87	U		P
7440-22-4	Silver	0.48	B	JK	P
7440-23-5	Sodium	197	B	JK	P
7440-28-0	Thallium	0.99	U		P
7440-62-2	Vanadium	17.3			P
7440-66-6	Zinc	36.8			P
	Cyanide				NR

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FEB 04 2002

CP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5007

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ08Z3

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38041S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 69.5

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4700			P
7440-36-0	Antimony	0.85	U	~~N~~ UJK	P
7440-38-2	Arsenic	4.0		U	P
7440-39-3	Barium	57.4			P
7440-41-7	Beryllium	0.24	B	JK	P
7440-43-9	Cadmium	0.33	B	JK	P
7440-70-2	Calcium	2510		E	P
7440-47-3	Chromium	15.7			P
7440-48-4	Cobalt	3.6	B	JK	P
7440-50-8	Copper	11.8		E JL	P
7439-89-6	Iron	14400			P
7439-92-1	Lead	21.5			P
7439-95-4	Magnesium	2760		E	P
7439-96-5	Manganese	267			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	10.5	B	JK	P
7440-09-7	Potassium	672	B	E JL	P
7782-49-2	Selenium	0.96	U		P
7440-22-4	Silver	0.71	B	JK	P
7440-23-5	Sodium	200	B	JK	P
7440-28-0	Thallium	1.1	U		P
7440-62-2	Vanadium	27.7			P
7440-66-6	Zinc	77.9			P
	Cyanide				NR

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FEB 04 2002

CP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5008

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ08Z4

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38042S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 61.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8240			P
7440-36-0	Antimony	0.97	B	~~N~~ JL	P
7440-38-2	Arsenic	5.1		U	P
7440-39-3	Barium	105			P
7440-41-7	Beryllium	0.42	B	JK	P
7440-43-9	Cadmium	0.73	B	JK	P
7440-70-2	Calcium	13200		~~E~~	P
7440-47-3	Chromium	23.3			P
7440-48-4	Cobalt	6.9	B	JK	P
7440-50-8	Copper	22.5		~~E~~ JL	P
7439-89-6	Iron	16600			P
7439-92-1	Lead	24.4			P
7439-95-4	Magnesium	5990		~~E~~	P
7439-96-5	Manganese	376			P
7439-97-6	Mercury	0.08	U	~~J~~	CV
7440-02-0	Nickel	21.0			P
7440-09-7	Potassium	1770		~~E~~ JL	P
7782-49-2	Selenium	1.1	U		P
7440-22-4	Silver	0.94	B	JK	P
7440-23-5	Sodium	289	B	JK	P
7440-28-0	Thallium	1.3	U		P
7440-62-2	Vanadium	32.0			P
7440-66-6	Zinc	99.0			P
	Cyanide				NR

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FEB 04 2002

CP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
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CS009

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ08Z5

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38043S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 90.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7440			P
7440-36-0	Antimony	0.65	U	≠ UJK	P
7440-38-2	Arsenic	6.6			P
7440-39-3	Barium	61.1			P
7440-41-7	Beryllium	0.29	B	JK	P
7440-43-9	Cadmium	0.25	B	JK	P
7440-70-2	Calcium	3350		≠	P
7440-47-3	Chromium	20.4			P
7440-48-4	Cobalt	6.7	B	JK	P
7440-50-8	Copper	21.9		≠ JL	P
7439-89-6	Iron	16500			P
7439-92-1	Lead	16.7			P
7439-95-4	Magnesium	4860		≠	P
7439-96-5	Manganese	250			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	21.0			P
7440-09-7	Potassium	1070	B	≠ JL	P
7782-49-2	Selenium	0.74	U		P
7440-22-4	Silver	0.85	B	JK	P
7440-23-5	Sodium	231	B	JK	P
7440-28-0	Thallium	0.85	U		P
7440-62-2	Vanadium	27.9			P
7440-66-6	Zinc	90.9			P
	Cyanide				NR

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FEB 04 2002

CP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS010

U.S. EPA - CLP
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EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ08Z6

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38044S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 94.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21200			P
7440-36-0	Antimony	0.63	U	~~N~~UJK	P
7440-38-2	Arsenic	5.0			P
7440-39-3	Barium	227			P
7440-41-7	Beryllium	0.84	B	JK	P
7440-43-9	Cadmium	4.4			P
7440-70-2	Calcium	4920		~~E~~	P
7440-47-3	Chromium	14.0			P
7440-48-4	Cobalt	5.8	B	JK	P
7440-50-8	Copper	33.9		~~E~~ JL	P
7439-89-6	Iron	14300			P
7439-92-1	Lead	86.6			P
7439-95-4	Magnesium	3220		~~E~~	P
7439-96-5	Manganese	347			P
7439-97-6	Mercury	0.14			CV
7440-02-0	Nickel	14.4			P
7440-09-7	Potassium	1400		~~E~~ JL	P
7782-49-2	Selenium	0.72	U		P
7440-22-4	Silver	0.76	B	JK	P
7440-23-5	Sodium	287	B	JK	P
7440-28-0	Thallium	0.82	U		P
7440-62-2	Vanadium	26.7			P
7440-66-6	Zinc	230			P
	Cyanide				NR

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FEB 04 2002

DP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CSOII

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ08Z7

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38045S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 44.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14300			P
7440-36-0	Antimony	3.6	B	≠ J L	P
7440-38-2	Arsenic	13.7			P
7440-39-3	Barium	512			P
7440-41-7	Beryllium	0.77	B	J K	P
7440-43-9	Cadmium	8.1			P
7440-70-2	Calcium	14100		≠	P
7440-47-3	Chromium	35.7			P
7440-48-4	Cobalt	9.4	B	J K	P
7440-50-8	Copper	91.7		≠ J L	P
7439-89-6	Iron	28300			P
7439-92-1	Lead	464			P
7439-95-4	Magnesium	11200		≠	P
7439-96-5	Manganese	808			P
7439-97-6	Mercury	1.7			CV
7440-02-0	Nickel	27.0			P
7440-09-7	Potassium	2520		≠ J L	P
7782-49-2	Selenium	1.5	U		P
7440-22-4	Silver	2.7	B	J K	P
7440-23-5	Sodium	406	B	J K	P
7440-28-0	Thallium	1.7	U		P
7440-62-2	Vanadium	39.9			P
7440-66-6	Zinc	1060			P
	Cyanide				NR

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FEB 04 2002

DF 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5012

U.S. EPA - CLP
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EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ08Z8

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38046S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 47.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	14300			P
7440-36-0	Antimony	3.3	B	~~N~~ JL	P
7440-38-2	Arsenic	14.9			P
7440-39-3	Barium	596			P
7440-41-7	Beryllium	0.78	B	JK	P
7440-43-9	Cadmium	9.4			P
7440-70-2	Calcium	15900		~~E~~	P
7440-47-3	Chromium	35.9			P
7440-48-4	Cobalt	9.4	B	JK	P
7440-50-8	Copper	86.8		~~E~~ JL	P
7439-89-6	Iron	29600			P
7439-92-1	Lead	535			P
7439-95-4	Magnesium	12400		~~E~~	P
7439-96-5	Manganese	698			P
7439-97-6	Mercury	0.97			CV
7440-02-0	Nickel	27.4			P
7440-09-7	Potassium	2500		~~E~~ JL	P
7782-49-2	Selenium	1.4	U		P
7440-22-4	Silver	2.7	B	JK	P
7440-23-5	Sodium	429	B	JK	P
7440-28-0	Thallium	1.7	U		P
7440-62-2	Vanadium	40.6			P
7440-66-6	Zinc	1210			P
	Cyanide				NR

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FEB 04 2002

CP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C3013

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ08Z9

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38047S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 80.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12800			P
7440-36-0	Antimony	3.2	B	N JL	P
7440-38-2	Arsenic	19.0			P
7440-39-3	Barium	755			P
7440-41-7	Beryllium	0.64	B	JK	P
7440-43-9	Cadmium	11.1			P
7440-70-2	Calcium	27000		E	P
7440-47-3	Chromium	25.9			P
7440-48-4	Cobalt	7.4	B	JK	P
7440-50-8	Copper	73.4		E JL	P
7439-89-6	Iron	26800			P
7439-92-1	Lead	841			P
7439-95-4	Magnesium	18100		E	P
7439-96-5	Manganese	515			P
7439-97-6	Mercury	1.6			CV
7440-02-0	Nickel	21.9			P
7440-09-7	Potassium	1970		E JL	P
7782-49-2	Selenium	0.83	U		P
7440-22-4	Silver	1.9	B	JK	P
7440-23-5	Sodium	301	B	JK	P
7440-28-0	Thallium	0.95	U		P
7440-62-2	Vanadium	38.5			P
7440-66-6	Zinc	1460			P
	Cyanide				NR

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6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS014

U.S. EPA - CLP
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EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0900

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38048S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 40.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15400			P
7440-36-0	Antimony	4.1	B	~~N~~ JL	P
7440-38-2	Arsenic	12.3			P
7440-39-3	Barium	468			P
7440-41-7	Beryllium	0.83	B	JK	P
7440-43-9	Cadmium	7.5			P
7440-70-2	Calcium	12100		~~E~~	P
7440-47-3	Chromium	38.0			P
7440-48-4	Cobalt	10	B	JK	P
7440-50-8	Copper	111		~~E~~ JL	P
7439-89-6	Iron	29400			P
7439-92-1	Lead	440			P
7439-95-4	Magnesium	10300		~~E~~	P
7439-96-5	Manganese	610			P
7439-97-6	Mercury	1.0			CV
7440-02-0	Nickel	28.5			P
7440-09-7	Potassium	2680		~~E~~ JL	P
7782-49-2	Selenium	1.7	U		P
7440-22-4	Silver	2.9	B	JK	P
7440-23-5	Sodium	490	B	JK	P
7440-28-0	Thallium	1.9	U		P
7440-62-2	Vanadium	42.4			P
7440-66-6	Zinc	1000			P
	Cyanide				NR

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FEB 04 2002

CP 6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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CS015

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0901

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38049S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 88.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9120			P
7440-36-0	Antimony	1.5	B	~~J~~ JL	P
7440-38-2	Arsenic	6.2			P
7440-39-3	Barium	229			P
7440-41-7	Beryllium	0.46	B	JK	P
7440-43-9	Cadmium	3.4			P
7440-70-2	Calcium	7040		~~J~~	P
7440-47-3	Chromium	21.1			P
7440-48-4	Cobalt	5.9	B	JK	P
7440-50-8	Copper	49.2		~~J~~ JL	P
7439-89-6	Iron	16800			P
7439-92-1	Lead	190			P
7439-95-4	Magnesium	6130		~~J~~	P
7439-96-5	Manganese	294			P
7439-97-6	Mercury	0.54			CV
7440-02-0	Nickel	16.5			P
7440-09-7	Potassium	1630		~~J~~ JL	P
7782-49-2	Selenium	0.76	U		P
7440-22-4	Silver	1.4	B	JK	P
7440-23-5	Sodium	249	B	JK	P
7440-28-0	Thallium	0.87	U		P
7440-62-2	Vanadium	25.8			P
7440-66-6	Zinc	470			P
	Cyanide				NR

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FEB 04 2002

6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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CS016

U.S. EPA - CLP
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EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0902

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38050S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 95.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13600			P
7440-36-0	Antimony	1.5	B	~~N~~ JL	P
7440-38-2	Arsenic	8.5			P
7440-39-3	Barium	261			P
7440-41-7	Beryllium	0.71	B	JK	P
7440-43-9	Cadmium	3.8			P
7440-70-2	Calcium	7150		~~E~~	P
7440-47-3	Chromium	28.6			P
7440-48-4	Cobalt	8.7	B	JK	P
7440-50-8	Copper	73.0		~~E~~ JL	P
7439-89-6	Iron	23800			P
7439-92-1	Lead	162			P
7439-95-4	Magnesium	7240		~~E~~	P
7439-96-5	Manganese	572			P
7439-97-6	Mercury	0.31			CV
7440-02-0	Nickel	24.0			P
7440-09-7	Potassium	2290		~~E~~ JL	P
7782-49-2	Selenium	0.84	B	JK	P
7440-22-4	Silver	1.7	B	JK	P
7440-23-5	Sodium	248	B	JK	P
7440-28-0	Thallium	0.80	U		P
7440-62-2	Vanadium	37.2			P
7440-66-6	Zinc	462			P
	Cyanide				NR

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Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5017

EPA SAMPLE NO.

MJ0903

INORGANIC ANALYSIS DATA SHEET

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ08Y3

Matrix (soil/water): SOIL Lab Sample ID: 38051S

Level (low/med): LOW Date Received: 05/22/01

% Solids: 78.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9540			P
7440-36-0	Antimony	2.4	B	≠ JL	P
7440-38-2	Arsenic	13.1			P
7440-39-3	Barium	1030			P
7440-41-7	Beryllium	0.53	B	JK	P
7440-43-9	Cadmium	8.6			P
7440-70-2	Calcium	34900		≠	P
7440-47-3	Chromium	25.2			P
7440-48-4	Cobalt	6.5	B	JK	P
7440-50-8	Copper	67.7		≠ JL	P
7439-89-6	Iron	25900			P
7439-92-1	Lead	439			P
7439-95-4	Magnesium	21400		≠	P
7439-96-5	Manganese	420			P
7439-97-6	Mercury	0.93			CV
7440-02-0	Nickel	22.7			P
7440-09-7	Potassium	1590		≠ JL	P
7782-49-2	Selenium	0.86	U		P
7440-22-4	Silver	1.8	B	JK	P
7440-23-5	Sodium	276	B	JK	P
7440-28-0	Thallium	0.98	U		P
7440-62-2	Vanadium	33.9			P
7440-66-6	Zinc	1180			P
	Cyanide				NR

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FEB 04 2002

6-25-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

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ENVIRONMENTAL SERVICES ASSISTANCE TEAM

received 8-6-01 SMF

ESAT Region 10
7411 Beach Drive East
Port Orchard, WA 98366
Phone (360) 871-8723

DELIVERABLE NARRATIVE

DATE: June 27, 2001

To: Ginna Grepo-Grove, TOPO, USEPA, Region 10

THROUGH: Dave Dobb, Team Manager, ESAT Region 10 DD

FROM: Chris Pace, Data Validation Task Lead, ESAT Region 10 CP

SUBJECT: Data Validation Report for the Inorganic Analysis of Samples from the Upper Columbia River Lake Roosevelt site. Case: 29276 SDG: MJ0924

Account Code: 01T10P50102D106XLA00

Doc. #: ES10-0-1071
TDN: 1035
Task Order: 001
Contract: 68-W-01-027

CC: Gerald Dodo, PO, USEPA, Region 10
Project File

The quality assurance (QA) review of 20 soil samples collected from the above referenced site has been completed. These samples were analyzed for total metals by Sentinel, Inc. of Huntsville, AL. The following samples were reviewed in this validation report:

MJ0924	MJ0929	MJ0956	MJ0961
MJ0925	MJ0952	MJ0957	MJ0962
MJ0926	MJ0953	MJ0958	MJ0963
MJ0927	MJ0954	MJ0959	MJ0964
MJ0928	MJ0955	MJ0960	MJ0967

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in the Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganic Analysis (ILM04.1) and the USEPA CLP Functional Guidelines for Inorganic Data Review, 2/94.

The conclusions presented herein are based on the information provided for the review.

Analytes which yielded a negative response in the preparation blank and/or continuing calibration blank(s) at concentrations comparable to or less than the absolute value of the blank(s) were qualified as estimated, "J/UJ", due to possible low bias. The following samples were qualified:

Analyte	Associated Samples
thallium	MJ0955, MJ0956, MJ0957, MJ0958, MJ0959, MJ0960, MJ0961, MJ0962, MJ0963, MJ0964, MJ0967

ICP-AES Interference Check Sample - Acceptable

The ICP-AES interference check samples (ICS) were analyzed to verify inter-element and background correction factors. The frequency of analysis (beginning and end of sequence) and recovery criteria (80-120%) were met by all of the ICS analyzed. The recoveries ranged from 91-118%. None of the data were qualified on this basis.

ICP-AES Serial Dilution Analysis

Sample MJ0924 was analyzed for serial dilution. All of the analytes which exceeded the minimum concentration criterion (50 times the IDL) agreed within 10% difference with the exception of Al, Ba, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, K, V and Zn. Cu and Zn only slightly exceeded the 10% difference criteria and therefore, were not qualified on this basis. Results for Al, Ba, Ca, Cr, Co, Fe, Pb, Mg, Mn, K and V in all samples were qualified as estimated, "J". The "E" qualifiers applied by the laboratory were crossed-out by the reviewer.

Laboratory Control Sample - Acceptable

The frequency of analysis and the recovery criteria for the laboratory control sample was met. The recoveries ranged from 57-106%. None of the data were qualified on this basis.

Duplicate Sample Analysis - Acceptable

Sample MJ0924 was utilized for duplicate analysis. The duplicate results met the frequency of analysis and method control limit criteria (±20% RPD or ± CRDL) for all target analytes with the exception of cadmium, lead and magnesium. Cadmium, lead and magnesium did meet the suggested technical control limit criteria (±35% RPD or ± 2X CRDL) for soils. The "*" qualifiers applied by the laboratory were crossed-out by the reviewer. None of the data were qualified on this basis.

Matrix Spike Analysis

Sample MJ0924 was used for the spike analysis. The frequency of analysis and recovery criteria were met with the exception of antimony (36%), arsenic (148%) and barium (142%) in the spike sample MJ0924S. Due to possible bias, the detected and non-detected antimony results in all samples were qualified as estimated, "J/UJ". Due to possible bias, the detected arsenic and barium results in all samples were qualified as estimated, "J". The "N" qualifiers applied by the laboratory were crossed-out by the reviewer. The recoveries for copper, lead and manganese could not be accurately determined because the concentrations native to the sample were greater than 4 times the amount of spike added to the sample. All of the other spike recoveries were acceptable and ranged from 89-111%.

C5038

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10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

ICP ID Number: P4 Date: 04/15/01

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	168.1	P
Antimony	206.80		60	3.0	P
Arsenic	189.00		10	4.0	P
Barium	493.40		200	1.7	P
Beryllium	313.00		5	0.2	P
Cadmium	226.50		5	0.3	P
Calcium	317.90		5000	136.5	P
Chromium	267.70		10	0.7	P
Cobalt	228.60		50	1.1	P
Copper	324.70		25	0.7	P
Iron	271.40		100	54.6	P
Lead	220.30		3	1.5	P
Magnesium	279.00		5000	132.2	P
Manganese	257.60		15	0.4	P
Mercury			0.2		NR
Nickel	231.60		40	1.5	P
Potassium	766.40		5000	15.4	P
Selenium	196.00		5	3.4	P
Silver	328.00		10	0.8	P
Sodium	330.20		5000	130.9	P
Thallium	190.80		10	3.9	P
Vanadium	292.40		50	0.9	P
Zinc	206.20		20	0.8	P
Cyanide			10		NR

Comments:

P4: THERMO JARRELL ASH

U.S. EPA - CLP

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

ICP ID Number: Date: 04/15/01

Flame AA ID Number: C5

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.1	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR
Cyanide			10		NR

Comments:

C5: CETAC M6000

U.S. EPA - CLP

13
PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Method: P

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	05/31/01	1.00	200
MJ0924	05/31/01	1.00	200
MJ0924D	05/31/01	1.00	200
MJ0924S	05/31/01	1.00	200
MJ0925	05/31/01	1.00	200
MJ0926	05/31/01	1.00	200
MJ0927	05/31/01	1.00	200
MJ0928	05/31/01	1.00	200
MJ0929	05/31/01	1.00	200
MJ0952	05/31/01	1.00	200
MJ0953	05/31/01	1.00	200
MJ0954	05/31/01	1.01	200
MJ0955	05/31/01	1.00	200
MJ0956	05/31/01	1.01	200
MJ0957	05/31/01	1.01	200
MJ0958	05/31/01	1.00	200
MJ0959	05/31/01	1.01	200
MJ0960	05/31/01	1.01	200
MJ0961	05/31/01	1.00	200
MJ0962	05/31/01	1.01	200
MJ0963	05/31/01	1.01	200
MJ0964	05/31/01	1.00	200
MJ0967	05/31/01	1.01	200
PBS	05/31/01	1.00	200

U.S. EPA - CLP

13
PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Method: CV

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	05/31/01	0.20	100
MJ0924	05/31/01	0.20	100
MJ0924D	05/31/01	0.20	100
MJ0924S	05/31/01	0.20	100
MJ0925	05/31/01	0.20	100
MJ0926	05/31/01	0.20	100
MJ0927	05/31/01	0.20	100
MJ0928	05/31/01	0.20	100
MJ0929	05/31/01	0.20	100
MJ0952	05/31/01	0.20	100
MJ0953	05/31/01	0.20	100
MJ0954	05/31/01	0.21	100
MJ0955	05/31/01	0.20	100
MJ0956	05/31/01	0.21	100
MJ0957	05/31/01	0.20	100
MJ0958	05/31/01	0.21	100
MJ0959	05/31/01	0.20	100
MJ0960	05/31/01	0.20	100
MJ0961	05/31/01	0.21	100
MJ0962	05/31/01	0.20	100
MJ0963	05/31/01	0.21	100
MJ0964	05/31/01	0.20	100
MJ0967	05/31/01	0.21	100
PBS	05/31/01	0.20	100

C5038

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0924

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38203S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 99.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	12400		E JL	P
7440-36-0	Antimony	10.4	B	N JL	P
7440-38-2	Arsenic	17.3		N JH	P
7440-39-3	Barium	603		ME JK	P
7440-41-7	Beryllium	0.53	B		P
7440-43-9	Cadmium	2.1		/	P
7440-70-2	Calcium	28900		E JL	P
7440-47-3	Chromium	35.1		E JL	P
7440-48-4	Cobalt	15.1		E JL	P
7440-50-8	Copper	823		E	P
7439-89-6	Iron	109000		E JL	P
7439-92-1	Lead	784		*E JL	P
7439-95-4	Magnesium	5020		*E JL	P
7439-96-5	Manganese	2090		E JL	P
7439-97-6	Mercury	0.13			CV
7440-02-0	Nickel	8.5			P
7440-09-7	Potassium	2300		E JL	P
7782-49-2	Selenium	4.2			P
7440-22-4	Silver	2.9			P
7440-23-5	Sodium	723	B		P
7440-28-0	Thallium	2.4			P
7440-62-2	Vanadium	29.5		E JL	P
7440-66-6	Zinc	13900		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5039

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0925

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38204S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 95.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4950		~~E~~ JL	P
7440-36-0	Antimony	3.4	B	~~N~~ UJ	P
7440-38-2	Arsenic	9.6		~~N~~ JH	P
7440-39-3	Barium	768		~~N~~ ~~E~~ JK	P
7440-41-7	Beryllium	0.28	B		P
7440-43-9	Cadmium	5.3		~~E~~	P
7440-70-2	Calcium	46900		~~E~~ JL	P
7440-47-3	Chromium	12.5		~~E~~ JL	P
7440-48-4	Cobalt	4.1	B	~~E~~ JL	P
7440-50-8	Copper	102		~~E~~	P
7439-89-6	Iron	25000		~~E~~ JL	P
7439-92-1	Lead	289		~~*~~ ~~E~~ JL	P
7439-95-4	Magnesium	25000		~~*~~ ~~E~~ JL	P
7439-96-5	Manganese	442		~~E~~ JL	P
7439-97-6	Mercury	0.29			CV
7440-02-0	Nickel	10.9			P
7440-09-7	Potassium	883	B	~~E~~ JL	P
7782-49-2	Selenium	0.82	B		P
7440-22-4	Silver	0.63	B		P
7440-23-5	Sodium	228	B		P
7440-28-0	Thallium	1.1	B		P
7440-62-2	Vanadium	23.0		~~E~~ JL	P
7440-66-6	Zinc	1990		~~E~~	P
	Cyanide				NR

CR 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5040

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0926

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38205S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 98.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6520		E JL	P
7440-36-0	Antimony	19.2		N JL	P
7440-38-2	Arsenic	9.1		N JH	P
7440-39-3	Barium	452		NE JK	P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	1.9		E	P
7440-70-2	Calcium	24700		E JL	P
7440-47-3	Chromium	27.1		E JL	P
7440-48-4	Cobalt	12.0		E JL	P
7440-50-8	Copper	362		E	P
7439-89-6	Iron	37600		E JL	P
7439-92-1	Lead	172		*E JL	P
7439-95-4	Magnesium	9750		*E JL	P
7439-96-5	Manganese	743		E JL	P
7439-97-6	Mercury	0.08	B		CV
7440-02-0	Nickel	11.1			P
7440-09-7	Potassium	1330		E JL	P
7782-49-2	Selenium	1.8			P
7440-22-4	Silver	2.1			P
7440-23-5	Sodium	377	B		P
7440-28-0	Thallium	1.2	B		P
7440-62-2	Vanadium	21.5		E JL	P
7440-66-6	Zinc	2770		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5041

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0927

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38206S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 99.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6550		E JL	P
7440-36-0	Antimony	17.2		N JL	P
7440-38-2	Arsenic	8.7		N JH	P
7440-39-3	Barium	495		NE JK	P
7440-41-7	Beryllium	0.32	B		P
7440-43-9	Cadmium	2.1		E	P
7440-70-2	Calcium	28200		E JL	P
7440-47-3	Chromium	32.8		E JL	P
7440-48-4	Cobalt	13.7		E JL	P
7440-50-8	Copper	451		E	P
7439-89-6	Iron	48200		E JL	P
7439-92-1	Lead	175		E JL	P
7439-95-4	Magnesium	9960		E JL	P
7439-96-5	Manganese	908		E JL	P
7439-97-6	Mercury	0.07	B		CV
7440-02-0	Nickel	10.2			P
7440-09-7	Potassium	1260		E JL	P
7782-49-2	Selenium	2.1			P
7440-22-4	Silver	2.2			P
7440-23-5	Sodium	475	B		P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	21.4		E JL	P
7440-66-6	Zinc	3760		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS042

U.S. EPA - CLP
1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0928

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38207S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 99.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9280		E JL	P
7440-36-0	Antimony	20.7		N JL	P
7440-38-2	Arsenic	13.9		N JH	P
7440-39-3	Barium	632		NE JK	P
7440-41-7	Beryllium	0.43	B		P
7440-43-9	Cadmium	1.6			P
7440-70-2	Calcium	26500		E JL	P
7440-47-3	Chromium	44.8		E JL	P
7440-48-4	Cobalt	17.7		E JL	P
7440-50-8	Copper	720		E	P
7439-89-6	Iron	79700		E JL	P
7439-92-1	Lead	446		E JL	P
7439-95-4	Magnesium	5520		E JL	P
7439-96-5	Manganese	1500		E JL	P
7439-97-6	Mercury	0.13			CV
7440-02-0	Nickel	9.6			P
7440-09-7	Potassium	1740		E JL	P
7782-49-2	Selenium	3.2			P
7440-22-4	Silver	3.9			P
7440-23-5	Sodium	666	B		P
7440-28-0	Thallium	2.3			P
7440-62-2	Vanadium	26.2		E JL	P
7440-66-6	Zinc	8710		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

cs043

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0929

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38208S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 99.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15500		E JL	P
7440-36-0	Antimony	27.1		N JL	P
7440-38-2	Arsenic	20.3		N JH	P
7440-39-3	Barium	1140		NE JK	P
7440-41-7	Beryllium	0.69	B		P
7440-43-9	Cadmium	1.6		/	P
7440-70-2	Calcium	46900		E JL	P
7440-47-3	Chromium	76.8		E JL	P
7440-48-4	Cobalt	35.2		E JL	P
7440-50-8	Copper	1550		E	P
7439-89-6	Iron	137000		E JL	P
7439-92-1	Lead	1040		/E JL	P
7439-95-4	Magnesium	5780		/E JL	P
7439-96-5	Manganese	3060		E JL	P
7439-97-6	Mercury	0.06	B		CV
7440-02-0	Nickel	12.2			P
7440-09-7	Potassium	3750		E JL	P
7782-49-2	Selenium	4.5			P
7440-22-4	Silver	5.7			P
7440-23-5	Sodium	1660			P
7440-28-0	Thallium	4.6			P
7440-62-2	Vanadium	39.2		E JL	P
7440-66-6	Zinc	15000		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0952

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38209S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 98.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7070		E JL	P
7440-36-0	Antimony	1.0	B	N JL	P
7440-38-2	Arsenic	3.2		N JH	P
7440-39-3	Barium	74.5		NE JK	P
7440-41-7	Beryllium	0.32	B		P
7440-43-9	Cadmium	0.86	B		P
7440-70-2	Calcium	6540		E JL	P
7440-47-3	Chromium	14.4		E JL	P
7440-48-4	Cobalt	4.2	B	E JL	P
7440-50-8	Copper	11.2		E	P
7439-89-6	Iron	11600		E JL	P
7439-92-1	Lead	47.4		NE JL	P
7439-95-4	Magnesium	3390		NE JL	P
7439-96-5	Manganese	190		E JL	P
7439-97-6	Mercury	0.14			CV
7440-02-0	Nickel	11.6			P
7440-09-7	Potassium	1710		E JL	P
7782-49-2	Selenium	0.69	U		P
7440-22-4	Silver	0.30	B		P
7440-23-5	Sodium	168	B		P
7440-28-0	Thallium	0.79	U		P
7440-62-2	Vanadium	19.7		E JL	P
7440-66-6	Zinc	78.1		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0953

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38210S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 60.5

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7770		E JL	P
7440-36-0	Antimony	9.4	B	N JL	P
7440-38-2	Arsenic	25.4		N JH	P
7440-39-3	Barium	406		NE JK	P
7440-41-7	Beryllium	0.30	B		P
7440-43-9	Cadmium	15.3			P
7440-70-2	Calcium	17500		E JL	P
7440-47-3	Chromium	12.5		E JL	P
7440-48-4	Cobalt	5.4	B	E JL	P
7440-50-8	Copper	33.5		E	P
7439-89-6	Iron	15300		E JL	P
7439-92-1	Lead	603		*E JL	P
7439-95-4	Magnesium	4520		*E JL	P
7439-96-5	Manganese	997		E JL	P
7439-97-6	Mercury	0.22			CV
7440-02-0	Nickel	14.2			P
7440-09-7	Potassium	2020		E JL	P
7782-49-2	Selenium	1.6	B		P
7440-22-4	Silver	0.66	B		P
7440-23-5	Sodium	260	B		P
7440-28-0	Thallium	1.3	U		P
7440-62-2	Vanadium	23.1		E JL	P
7440-66-6	Zinc	585		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

FORM I - IN ILM04.1

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0954

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38211S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 93.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9190		E JL	P
7440-36-0	Antimony	3.3	B	N JL	P
7440-38-2	Arsenic	54.0		N JH	P
7440-39-3	Barium	183		NE JK	P
7440-41-7	Beryllium	0.45	B		P
7440-43-9	Cadmium	2.1			P
7440-70-2	Calcium	5390		E JL	P
7440-47-3	Chromium	12.4		E JL	P
7440-48-4	Cobalt	8.1	B	E JL	P
7440-50-8	Copper	31.4		E	P
7439-89-6	Iron	22700		E JL	P
7439-92-1	Lead	85.5		NE JL	P
7439-95-4	Magnesium	3860		NE JL	P
7439-96-5	Manganese	716		E JL	P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	17.6			P
7440-09-7	Potassium	2820		E JL	P
7782-49-2	Selenium	1.5			P
7440-22-4	Silver	0.62	B		P
7440-23-5	Sodium	154	B		P
7440-28-0	Thallium	0.83	U		P
7440-62-2	Vanadium	27.3		E JL	P
7440-66-6	Zinc	146		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

11

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0955

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38212S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 77.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8750		~~E~~ JL	P
7440-36-0	Antimony	3.4	B	~~N~~ JL	P
7440-38-2	Arsenic	23.5		~~N~~ JH	P
7440-39-3	Barium	128		~~NE~~ JK	P
7440-41-7	Beryllium	0.36	B		P
7440-43-9	Cadmium	2.5		~~E~~	P
7440-70-2	Calcium	24100		~~E~~ JL	P
7440-47-3	Chromium	14.5		~~E~~ JL	P
7440-48-4	Cobalt	6.4	B	~~E~~ JL	P
7440-50-8	Copper	30.3		~~E~~	P
7439-89-6	Iron	17500		~~E~~ JL	P
7439-92-1	Lead	107		~~E~~ JL	P
7439-95-4	Magnesium	6170		~~E~~ JL	P
7439-96-5	Manganese	659		~~E~~ JL	P
7439-97-6	Mercury	0.09	B		CV
7440-02-0	Nickel	17.8			P
7440-09-7	Potassium	1870		~~E~~ JL	P
7782-49-2	Selenium	3.0			P
7440-22-4	Silver	0.55	B		P
7440-23-5	Sodium	222	B		P
7440-28-0	Thallium	1.0	U	UJK	P
7440-62-2	Vanadium	21.9		~~E~~ JL	P
7440-66-6	Zinc	202		~~E~~	P
	Cyanide				NR

CF 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0956

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38213S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 50.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6080		E JL	P
7440-36-0	Antimony	1.8	B	N JL	P
7440-38-2	Arsenic	9.8		N JH	P
7440-39-3	Barium	130		NE JK	P
7440-41-7	Beryllium	0.21	B		P
7440-43-9	Cadmium	0.23	B	E	P
7440-70-2	Calcium	102000		E JL	P
7440-47-3	Chromium	16.7		E JL	P
7440-48-4	Cobalt	5.8	B	E JL	P
7440-50-8	Copper	15.5		E	P
7439-89-6	Iron	12700		E JL	P
7439-92-1	Lead	13.8		*E JL	P
7439-95-4	Magnesium	5740		*E JL	P
7439-96-5	Manganese	340		E JL	P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	18.8			P
7440-09-7	Potassium	1070	B	E JL	P
7782-49-2	Selenium	2.2			P
7440-22-4	Silver	0.31	U		P
7440-23-5	Sodium	380	B		P
7440-28-0	Thallium	1.5	U	UJK	P
7440-62-2	Vanadium	17.9	B	E JL	P
7440-66-6	Zinc	79.4		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0957

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38214S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 25.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5770		E JL	P
7440-36-0	Antimony	2.6	B	N JL	P
7440-38-2	Arsenic	3.1	U	N	P
7440-39-3	Barium	114	B	NE JK	P
7440-41-7	Beryllium	0.23	B		P
7440-43-9	Cadmium	1.4	B	*	P
7440-70-2	Calcium	59900		E JL	P
7440-47-3	Chromium	13.8		E JL	P
7440-48-4	Cobalt	3.1	B	E JL	P
7440-50-8	Copper	27.9		E	P
7439-89-6	Iron	9180		E JL	P
7439-92-1	Lead	54.3		*E JL	P
7439-95-4	Magnesium	6130		*E JL	P
7439-96-5	Manganese	133		E JL	P
7439-97-6	Mercury	0.19	U		CV
7440-02-0	Nickel	19.3	B		P
7440-09-7	Potassium	1540	B	E JL	P
7782-49-2	Selenium	5.0			P
7440-22-4	Silver	0.61	U		P
7440-23-5	Sodium	611	B		P
7440-28-0	Thallium	3.0	U	UJK	P
7440-62-2	Vanadium	14.9	B	E JL	P
7440-66-6	Zinc	117		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

FORM I - IN ILM04.1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0958

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38215S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 80.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5650		~~E~~ JL	P
7440-36-0	Antimony	2.4	B	~~N~~ JL	P
7440-38-2	Arsenic	6.3		~~N~~ JH	P
7440-39-3	Barium	152		~~NE~~ JK	P
7440-41-7	Beryllium	0.24	B		P
7440-43-9	Cadmium	2.4		~~E~~	P
7440-70-2	Calcium	82600		~~E~~ JL	P
7440-47-3	Chromium	12.0		~~E~~ JL	P
7440-48-4	Cobalt	3.9	B	~~E~~ JL	P
7440-50-8	Copper	18.9		~~E~~	P
7439-89-6	Iron	9040		~~E~~ JL	P
7439-92-1	Lead	79.4		~~NE~~ JL	P
7439-95-4	Magnesium	4970		~~NE~~ JL	P
7439-96-5	Manganese	289		~~E~~ JL	P
7439-97-6	Mercury	0.10	B		CV
7440-02-0	Nickel	11.7			P
7440-09-7	Potassium	1540		~~E~~ JL	P
7782-49-2	Selenium	1.1	B		P
7440-22-4	Silver	0.25	B		P
7440-23-5	Sodium	237	B		P
7440-28-0	Thallium	0.98	U	UJK	P
7440-62-2	Vanadium	13.8		~~E~~ JL	P
7440-66-6	Zinc	185		~~E~~	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0959

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38216S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 65.5

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6290		E JL	P
7440-36-0	Antimony	3.5	B	N JL	P
7440-38-2	Arsenic	4.1		N JH	P
7440-39-3	Barium	115		NE JK	P
7440-41-7	Beryllium	0.25	B		P
7440-43-9	Cadmium	8.4		E	P
7440-70-2	Calcium	34300		E JL	P
7440-47-3	Chromium	14.1		E JL	P
7440-48-4	Cobalt	3.4	B	E JL	P
7440-50-8	Copper	41.3		E	P
7439-89-6	Iron	10700		E JL	P
7439-92-1	Lead	128		*E JL	P
7439-95-4	Magnesium	5130		*E JL	P
7439-96-5	Manganese	288		E JL	P
7439-97-6	Mercury	0.11	B		CV
7440-02-0	Nickel	33.5			P
7440-09-7	Potassium	1460	B	E JL	P
7782-49-2	Selenium	3.8			P
7440-22-4	Silver	0.43	B		P
7440-23-5	Sodium	350	B		P
7440-28-0	Thallium	1.2	U	UJK	P
7440-62-2	Vanadium	28.9		E JL	P
7440-66-6	Zinc	212		E	P
	Cyanide				NR

CN 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0960

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38217S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 97.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3350		E J L	P
7440-36-0	Antimony	0.61	U	~~N~~ U J K	P
7440-38-2	Arsenic	1.8	B	~~N~~ J H	P
7440-39-3	Barium	37.7	B	~~N~~ E J K	P
7440-41-7	Beryllium	0.16	B		P
7440-43-9	Cadmium	0.07	B	~~E~~	P
7440-70-2	Calcium	1780		~~E~~ J L	P
7440-47-3	Chromium	6.8		~~E~~ J L	P
7440-48-4	Cobalt	2.4	B	~~E~~ J L	P
7440-50-8	Copper	5.5		~~E~~	P
7439-89-6	Iron	6340		~~E~~ J L	P
7439-92-1	Lead	5.3		~~E~~ E J L	P
7439-95-4	Magnesium	1610		~~E~~ E J L	P
7439-96-5	Manganese	114		~~E~~ J L	P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	6.0	B		P
7440-09-7	Potassium	689	B	~~E~~ J L	P
7782-49-2	Selenium	0.69	U		P
7440-22-4	Silver	0.16	U		P
7440-23-5	Sodium	141	B		P
7440-28-0	Thallium	0.79	U	U J K	P
7440-62-2	Vanadium	10.8		~~E~~ J L	P
7440-66-6	Zinc	27.4		~~E~~	P
	Cyanide				NR

CF 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0961

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38218S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 67.5

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	3510		E JL	P
7440-36-0	Antimony	1.3	B	N JL	P
7440-38-2	Arsenic	6.2		N JH	P
7440-39-3	Barium	72.9		NE JK	P
7440-41-7	Beryllium	0.13	B		P
7440-43-9	Cadmium	0.32	B		P
7440-70-2	Calcium	19500		E JL	P
7440-47-3	Chromium	10.2		E JL	P
7440-48-4	Cobalt	2.1	B	E JL	P
7440-50-8	Copper	10.1		E	P
7439-89-6	Iron	9260		E JL	P
7439-92-1	Lead	15.7		*E JL	P
7439-95-4	Magnesium	3890		*E JL	P
7439-96-5	Manganese	95.1		E JL	P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	9.7	B		P
7440-09-7	Potassium	647	B	E JL	P
7782-49-2	Selenium	1.8			P
7440-22-4	Silver	0.24	U		P
7440-23-5	Sodium	244	B		P
7440-28-0	Thallium	1.2	U	UJK	P
7440-62-2	Vanadium	12.2	B	E JL	P
7440-66-6	Zinc	103		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0962

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38219S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 92.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1120		E JL	P
7440-36-0	Antimony	1.2	B	N JL	P
7440-38-2	Arsenic	2.3		N JH	P
7440-39-3	Barium	119		NE JK	P
7440-41-7	Beryllium	0.04	U		P
7440-43-9	Cadmium	0.41	B		P
7440-70-2	Calcium	306000		E JL	P
7440-47-3	Chromium	1.5	B	E JL	P
7440-48-4	Cobalt	0.48	B	E JL	P
7440-50-8	Copper	4.0	B	E	P
7439-89-6	Iron	1440		E JL	P
7439-92-1	Lead	10.8		E JL	P
7439-95-4	Magnesium	2980		E JL	P
7439-96-5	Manganese	41.4		E JL	P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	3.3	B		P
7440-09-7	Potassium	296	B	E JL	P
7782-49-2	Selenium	0.73	U		P
7440-22-4	Silver	0.17	U		P
7440-23-5	Sodium	205	B		P
7440-28-0	Thallium	0.84	U	u JK	P
7440-62-2	Vanadium	3.6	B	E JL	P
7440-66-6	Zinc	28.5		E	P
	Cyanide				NR

CF 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0963

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38220S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 74.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	924		E JL	P
7440-36-0	Antimony	0.80	U	UJK	P
7440-38-2	Arsenic	2.6	B	JH	P
7440-39-3	Barium	145		E JK	P
7440-41-7	Beryllium	0.05	U		P
7440-43-9	Cadmium	0.77	B	E	P
7440-70-2	Calcium	336000		E JL	P
7440-47-3	Chromium	1.7	B	E JL	P
7440-48-4	Cobalt	0.44	B	E JL	P
7440-50-8	Copper	6.3	B	E	P
7439-89-6	Iron	1030		E JL	P
7439-92-1	Lead	18.9		E JL	P
7439-95-4	Magnesium	3800		E JL	P
7439-96-5	Manganese	46.6		E JL	P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	2.9	B		P
7440-09-7	Potassium	265	B	E JL	P
7782-49-2	Selenium	0.91	U		P
7440-22-4	Silver	0.21	U		P
7440-23-5	Sodium	276	B		P
7440-28-0	Thallium	1.0	U	UJK	P
7440-62-2	Vanadium	2.7	B	E JL	P
7440-66-6	Zinc	55.7		E	P
	Cyanide				NR

6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0964

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38221S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 30.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9000		~~E~~ JL	P
7440-36-0	Antimony	2.5	B	~~N~~ JL	P
7440-38-2	Arsenic	7.0		~~N~~ JH	P
7440-39-3	Barium	126	B	~~NE~~ JK	P
7440-41-7	Beryllium	0.35	B		P
7440-43-9	Cadmium	5.1		~~E~~	P
7440-70-2	Calcium	42800		~~E~~ JL	P
7440-47-3	Chromium	19.7		~~E~~ JL	P
7440-48-4	Cobalt	5.2	B	~~E~~ JL	P
7440-50-8	Copper	36.0		~~E~~	P
7439-89-6	Iron	11700		~~E~~ JL	P
7439-92-1	Lead	21.8		~~NE~~ JL	P
7439-95-4	Magnesium	4100		~~NE~~ JL	P
7439-96-5	Manganese	238		~~E~~ JL	P
7439-97-6	Mercury	0.16	U		CV
7440-02-0	Nickel	35.0			P
7440-09-7	Potassium	1320	B	~~E~~ JL	P
7782-49-2	Selenium	3.3			P
7440-22-4	Silver	0.70	B		P
7440-23-5	Sodium	723	B		P
7440-28-0	Thallium	2.5	U	UJK	P
7440-62-2	Vanadium	24.6	B	~~E~~ JL	P
7440-66-6	Zinc	135		~~E~~	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0967

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0924

Matrix (soil/water): SOIL Lab Sample ID: 38222S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 90.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7530		E JL	P
7440-36-0	Antimony	1.2	B	N JL	P
7440-38-2	Arsenic	7.7		N JH	P
7440-39-3	Barium	84.6		NE JK	P
7440-41-7	Beryllium	0.31	B		P
7440-43-9	Cadmium	1.3		N	P
7440-70-2	Calcium	3030		E JL	P
7440-47-3	Chromium	16.8		E JL	P
7440-48-4	Cobalt	5.5	B	E JL	P
7440-50-8	Copper	15.5		E	P
7439-89-6	Iron	13500		E JL	P
7439-92-1	Lead	50.2		NE JL	P
7439-95-4	Magnesium	3700		NE JL	P
7439-96-5	Manganese	352		E JL	P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	14.8			P
7440-09-7	Potassium	1910		E JL	P
7782-49-2	Selenium	0.82	B		P
7440-22-4	Silver	0.40	B		P
7440-23-5	Sodium	217	B		P
7440-28-0	Thallium	0.85	U	UJK	P
7440-62-2	Vanadium	24.9		E JL	P
7440-66-6	Zinc	97.0		E	P
	Cyanide				NR

CP 6-26-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

ENVIRONMENTAL SERVICES ASSISTANCE TEAM

ESAT Region 10
7411 Beach Drive East
Port Orchard, WA 98366
Phone (360) 871-8723

received
8-6-01
SMF

DELIVERABLE NARRATIVE

DATE: July 9, 2001

To: Ginna Grepo-Grove, TOPO, USEPA, Region 10

THROUGH: Dave Dobb, Team Manager, ESAT Region 10 DD

FROM: Chris Pace, Data Validation Task Lead, ESAT Region 10 CP

SUBJECT: Data Validation Report for the Inorganic Analysis of Samples from the Upper Columbia River Lake Roosevelt site. Case: 29276 SDG: MJ0968

Account Code: 01T10P50102D106XLA00

Doc. #: ES10-0-1079
TDN: 1037
Task Order: 001
Contract: 68-W-01-027

CC: Gerald Dodo, PO, USEPA, Region 10
Project File

The quality assurance (QA) review of 20 soil samples collected from the above referenced site has been completed. These samples were analyzed for total metals by Sentinel, Inc. of Huntsville, AL. The following samples were reviewed in this validation report:

MJ0930	MJ0935	MJ0969	MJ0974
MJ0931	MJ0936	MJ0970	MJ0975
MJ0932	MJ0937	MJ0971	MJ0977
MJ0933	MJ0938	MJ0972	MJ0978
MJ0934	MJ0968	MJ0973	MJ0979

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in the Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganic Analysis (ILM04.1) and the USEPA CLP Functional Guidelines for Inorganic Data Review, 2/94.

The conclusions presented herein are based on the information provided for the review.

Analytes which yielded a negative response in the preparation blank and/or continuing calibration blank(s) at concentrations comparable to or less than the absolute value of the blank(s) were qualified as estimated, "J/UJ", due to possible low bias. The following samples were qualified:

Analyte	Associated Samples
arsenic	MJ0971
thallium	MJ0978, MJ0979

ICP-AES Interference Check Sample - Acceptable

The ICP-AES interference check samples (ICS) were analyzed to verify inter-element and background correction factors. The frequency of analysis (beginning and end of sequence) and recovery criteria (80-120%) were met by all of the ICS analyzed. The recoveries ranged from 83-113%. None of the data were qualified on this basis.

ICP-AES Serial Dilution Analysis

Sample MJ0971 was analyzed for serial dilution. All of the analytes which exceeded the minimum concentration criterion (50 times the IDL) agreed within 10% difference with the exception of copper and magnesium. Results for copper and magnesium in all samples were qualified as estimated, "J". The "E" qualifiers applied by the laboratory were crossed-out by the reviewer.

Laboratory Control Sample - Acceptable

The frequency of analysis and the recovery criteria for the laboratory control sample was met. The recoveries ranged from 57-110%. None of the data were qualified on this basis.

Duplicate Sample Analysis - Acceptable

Sample MJ0971 was utilized for duplicate analysis. The duplicate results met the frequency of analysis and method control limit criteria (±20% RPD or ± CRDL) for all target analytes with the exception of selenium. Selenium did meet the suggested technical control limit criteria (±35% RPD or ± 2X CRDL) for soils. The "*" qualifiers applied by the laboratory were crossed-out by the reviewer. None of the data were qualified on this basis.

Matrix Spike Analysis

Sample MJ0971 was used for the spike analysis. The frequency of analysis and recovery criteria were met with the exception of selenium (63%) in the spike sample MJ0971S. Due to possible bias, the detected and non-detected selenium results in all samples were qualified as estimated, "J/UJ". The "N" qualifiers applied by the laboratory were crossed-out by the reviewer. All of the other spike recoveries were acceptable and ranged from 82-102%.

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

ICP ID Number: P4 Date: 04/15/01

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	168.1	P
Antimony	206.80		60	3.0	P
Arsenic	189.00		10	4.0	P
Barium	493.40		200	1.7	P
Beryllium	313.00		5	0.2	P
Cadmium	226.50		5	0.3	P
Calcium	317.90		5000	136.5	P
Chromium	267.70		10	0.7	P
Cobalt	228.60		50	1.1	P
Copper	324.70		25	0.7	P
Iron	271.40		100	54.6	P
Lead	220.30		3	1.5	P
Magnesium	279.00		5000	132.2	P
Manganese	257.60		15	0.4	P
Mercury			0.2		NR
Nickel	231.60		40	1.5	P
Potassium	766.40		5000	15.4	P
Selenium	196.00		5	3.4	P
Silver	328.00		10	0.8	P
Sodium	330.20		5000	130.9	P
Thallium	190.80		10	3.9	P
Vanadium	292.40		50	0.9	P
Zinc	206.20		20	0.8	P
Cyanide			10		NR

Comments:

P4: THERMO JARRELL ASH

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INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

ICP ID Number: Date: 04/15/01

Flame AA ID Number: C5

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.1	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR
Cyanide			10		NR

Comments:
C5: CETAC M6000

U.S. EPA - CLP

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PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Method: P

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	06/06/01	1.00	200
MJ0930	06/06/01	1.00	200
MJ0931	06/06/01	1.02	200
MJ0932	06/06/01	1.00	200
MJ0933	06/06/01	1.00	200
MJ0934	06/06/01	1.02	200
MJ0935	06/06/01	1.02	200
MJ0936	06/06/01	1.02	200
MJ0937	06/06/01	1.00	200
MJ0938	06/06/01	1.02	200
MJ0968	06/06/01	1.00	200
MJ0969	06/06/01	1.01	200
MJ0970	06/06/01	1.01	200
MJ0971	06/06/01	1.00	200
MJ0971D	06/06/01	1.00	200
MJ0971S	06/06/01	1.00	200
MJ0972	06/06/01	1.01	200
MJ0973	06/06/01	1.01	200
MJ0974	06/06/01	1.01	200
MJ0975	06/06/01	1.00	200
MJ0977	06/06/01	1.02	200
MJ0978	06/06/01	1.02	200
MJ0979	06/06/01	1.01	200
PBS	06/06/01	1.00	200

13
PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Method: CV

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	06/06/01	0.20	100
MJ0930	06/06/01	0.21	100
MJ0931	06/06/01	0.21	100
MJ0932	06/06/01	0.20	100
MJ0933	06/06/01	0.20	100
MJ0934	06/06/01	0.21	100
MJ0935	06/06/01	0.20	100
MJ0936	06/06/01	0.22	100
MJ0937	06/06/01	0.21	100
MJ0938	06/06/01	0.20	100
MJ0968	06/06/01	0.20	100
MJ0969	06/06/01	0.22	100
MJ0970	06/06/01	0.21	100
MJ0971	06/06/01	0.20	100
MJ0971D	06/06/01	0.20	100
MJ0971S	06/06/01	0.20	100
MJ0972	06/06/01	0.22	100
MJ0973	06/06/01	0.20	100
MJ0974	06/06/01	0.20	100
MJ0975	06/06/01	0.22	100
MJ0977	06/06/01	0.20	100
MJ0978	06/06/01	0.20	100
MJ0979	06/06/01	0.22	100
PBS	06/06/01	0.20	100

C 5044

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1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0930

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38272S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 100.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21100			P
7440-36-0	Antimony	53.5			P
7440-38-2	Arsenic	25.5			P
7440-39-3	Barium	2160			P
7440-41-7	Beryllium	0.99	B		P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	69900			P
7440-47-3	Chromium	142			P
7440-48-4	Cobalt	59.0			P
7440-50-8	Copper	2900		E JL	P
7439-89-6	Iron	239000			P
7439-92-1	Lead	316			P
7439-95-4	Magnesium	5770		E JL	P
7439-96-5	Manganese	4040			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	17.0			P
7440-09-7	Potassium	4300			P
7782-49-2	Selenium	0.68	U	N* UJK	P
7440-22-4	Silver	7.5			P
7440-23-5	Sodium	2210			P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	42.3			P
7440-66-6	Zinc	20100			P
	Cyanide				NR

7-9-01
6-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5045

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0931

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38273S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 99.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	4710			P
7440-36-0	Antimony	9.9	B		P
7440-38-2	Arsenic	7.6			P
7440-39-3	Barium	486			P
7440-41-7	Beryllium	0.27	B		P
7440-43-9	Cadmium	4.8			P
7440-70-2	Calcium	54000			P
7440-47-3	Chromium	20.7			P
7440-48-4	Cobalt	8.4	B		P
7440-50-8	Copper	245		≠JL	P
7439-89-6	Iron	28000			P
7439-92-1	Lead	199			P
7439-95-4	Magnesium	26600		≠JL	P
7439-96-5	Manganese	585			P
7439-97-6	Mercury	0.06	B		CV
7440-02-0	Nickel	10.4			P
7440-09-7	Potassium	888	B		P
7782-49-2	Selenium	0.67	U	N≠UJK	P
7440-22-4	Silver	1.6	B		P
7440-23-5	Sodium	269	B		P
7440-28-0	Thallium	0.77	U		P
7440-62-2	Vanadium	22.1			P
7440-66-6	Zinc	2430			P
	Cyanide				NR

7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

FORM I - IN ILM04.1

C5046

U.S. EPA - CLP
1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0932

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38274S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 90.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	17400			P
7440-36-0	Antimony	57.5			P
7440-38-2	Arsenic	30.3			P
7440-39-3	Barium	1970			P
7440-41-7	Beryllium	0.86	B		P
7440-43-9	Cadmium	0.07	U		P
7440-70-2	Calcium	57600			P
7440-47-3	Chromium	135			P
7440-48-4	Cobalt	73.5			P
7440-50-8	Copper	2520		J	P
7439-89-6	Iron	176000			P
7439-92-1	Lead	409			P
7439-95-4	Magnesium	5040		J	P
7439-96-5	Manganese	3680			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	15.6			P
7440-09-7	Potassium	3580			P
7782-49-2	Selenium	1.4		N J	P
7440-22-4	Silver	10.2			P
7440-23-5	Sodium	2230			P
7440-28-0	Thallium	0.87	U		P
7440-62-2	Vanadium	39.1			P
7440-66-6	Zinc	17500			P
	Cyanide				NR

7-9-01
7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5047

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0933

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38275S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 100.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	17800			P
7440-36-0	Antimony	45.2			P
7440-38-2	Arsenic	21.6			P
7440-39-3	Barium	1690			P
7440-41-7	Beryllium	0.77	B		P
7440-43-9	Cadmium	0.19	B		P
7440-70-2	Calcium	66400			P
7440-47-3	Chromium	112			P
7440-48-4	Cobalt	47.3			P
7440-50-8	Copper	2160		E JL	P
7439-89-6	Iron	178000			P
7439-92-1	Lead	417			P
7439-95-4	Magnesium	10000		E JL	P
7439-96-5	Manganese	3240			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	14.4			P
7440-09-7	Potassium	3490			P
7782-49-2	Selenium	0.68	U	N*uJK	P
7440-22-4	Silver	7.4			P
7440-23-5	Sodium	1610			P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	37.7			P
7440-66-6	Zinc	18200			P
_____	Cyanide				NR

7-9-01
6-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

CS048

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.
MJ0934

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38276S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 100.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	18100			P
7440-36-0	Antimony	34.9			P
7440-38-2	Arsenic	30.3			P
7440-39-3	Barium	1660			P
7440-41-7	Beryllium	0.75	B		P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	58600			P
7440-47-3	Chromium	113			P
7440-48-4	Cobalt	33.8			P
7440-50-8	Copper	2160		E J L	P
7439-89-6	Iron	179000			P
7439-92-1	Lead	317			P
7439-95-4	Magnesium	6030		E J L	P
7439-96-5	Manganese	3130			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	13.0			P
7440-09-7	Potassium	3480			P
7782-49-2	Selenium	1.4		N J L	P
7440-22-4	Silver	5.9			P
7440-23-5	Sodium	1530			P
7440-28-0	Thallium	0.76	U		P
7440-62-2	Vanadium	36.3			P
7440-66-6	Zinc	16500			P
	Cyanide				NR

CP 7-9-01 ~~7-9-01~~

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C 5049

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0935

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38277S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 96.3

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	18700			P
7440-36-0	Antimony	7.4	B		P
7440-38-2	Arsenic	7.6			P
7440-39-3	Barium	681			P
7440-41-7	Beryllium	0.71	B		P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	46900			P
7440-47-3	Chromium	64.0			P
7440-48-4	Cobalt	15.0			P
7440-50-8	Copper	997		E JL	P
7439-89-6	Iron	165000			P
7439-92-1	Lead	282			P
7439-95-4	Magnesium	5750		E JL	P
7439-96-5	Manganese	2950			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	8.1	B		P
7440-09-7	Potassium	3770			P
7782-49-2	Selenium	2.1		N JL	P
7440-22-4	Silver	3.7			P
7440-23-5	Sodium	1050			P
7440-28-0	Thallium	0.79	U		P
7440-62-2	Vanadium	38.2			P
7440-66-6	Zinc	15400			P
	Cyanide				NR

CF 7-9-01 6-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

FORM I - IN ILM04.1

8

CS050

U.S. EPA - CLP
1

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0936

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38278S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 83.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8170			P
7440-36-0	Antimony	20.0			P
7440-38-2	Arsenic	11.8			P
7440-39-3	Barium	763			P
7440-41-7	Beryllium	0.38	B		P
7440-43-9	Cadmium	2.4			P
7440-70-2	Calcium	25300			P
7440-47-3	Chromium	30.2			P
7440-48-4	Cobalt	7.9	B		P
7440-50-8	Copper	444		E JL	P
7439-89-6	Iron	67100			P
7439-92-1	Lead	309			P
7439-95-4	Magnesium	8540		E JL	P
7439-96-5	Manganese	1080			P
7439-97-6	Mercury	0.29			CV
7440-02-0	Nickel	12.5			P
7440-09-7	Potassium	1400			P
7782-49-2	Selenium	1.4		N JL	P
7440-22-4	Silver	2.7			P
7440-23-5	Sodium	385	B		P
7440-28-0	Thallium	0.91	U		P
7440-62-2	Vanadium	28.8			P
7440-66-6	Zinc	4900			P
	Cyanide				NR

CP 7-9-01 ~~6-9-01~~

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

C5051

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0937

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38279S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 99.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	21100			P
7440-36-0	Antimony	61.3			P
7440-38-2	Arsenic	42.8			P
7440-39-3	Barium	2440			P
7440-41-7	Beryllium	1.0	B		P
7440-43-9	Cadmium	0.06	U		P
7440-70-2	Calcium	72400			P
7440-47-3	Chromium	165			P
7440-48-4	Cobalt	85.7			P
7440-50-8	Copper	3300		E JL	P
7439-89-6	Iron	245000			P
7439-92-1	Lead	512			P
7439-95-4	Magnesium	5970		E JL	P
7439-96-5	Manganese	4360			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	19.4			P
7440-09-7	Potassium	4330			P
7782-49-2	Selenium	0.68	U	N* uJK	P
7440-22-4	Silver	12.6			P
7440-23-5	Sodium	2630			P
7440-28-0	Thallium	0.78	U		P
7440-62-2	Vanadium	45.0			P
7440-66-6	Zinc	22300			P
	Cyanide				NR

UP 7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

FORM I - IN ILM04.1

CS052

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0938

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38280S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 86.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11000			P
7440-36-0	Antimony	51.4			P
7440-38-2	Arsenic	23.1			P
7440-39-3	Barium	989			P
7440-41-7	Beryllium	0.57	B		P
7440-43-9	Cadmium	0.07	U		P
7440-70-2	Calcium	30800			P
7440-47-3	Chromium	72.0			P
7440-48-4	Cobalt	33.4			P
7440-50-8	Copper	1330		E JL	P
7439-89-6	Iron	96900			P
7439-92-1	Lead	276			P
7439-95-4	Magnesium	3990		E JL	P
7439-96-5	Manganese	1990			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	13.6			P
7440-09-7	Potassium	2160			P
7782-49-2	Selenium	1.5		N* JL	P
7440-22-4	Silver	8.5			P
7440-23-5	Sodium	1000	B		P
7440-28-0	Thallium	0.89	U		P
7440-62-2	Vanadium	28.6			P
7440-66-6	Zinc	8820			P
	Cyanide				NR

cf 7-9-01
cf 6-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0968

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38223S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 73.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5300			P
7440-36-0	Antimony	2.1	B		P
7440-38-2	Arsenic	5.0			P
7440-39-3	Barium	98.0			P
7440-41-7	Beryllium	0.19	B		P
7440-43-9	Cadmium	3.7			P
7440-70-2	Calcium	11400			P
7440-47-3	Chromium	7.6			P
7440-48-4	Cobalt	2.6	B		P
7440-50-8	Copper	15.9		E JL	P
7439-89-6	Iron	8440			P
7439-92-1	Lead	105			P
7439-95-4	Magnesium	2690		E JL	P
7439-96-5	Manganese	326			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	7.4	B		P
7440-09-7	Potassium	1140	B		P
7782-49-2	Selenium	1.4		N* JL	P
7440-22-4	Silver	0.41	B		P
7440-23-5	Sodium	213	B		P
7440-28-0	Thallium	1.1	U		P
7440-62-2	Vanadium	13.3	B		P
7440-66-6	Zinc	421			P
	Cyanide				NR

CF 7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0969

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38224S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 95.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8880			P
7440-36-0	Antimony	0.63	B		P
7440-38-2	Arsenic	7.0			P
7440-39-3	Barium	108			P
7440-41-7	Beryllium	0.34	B		P
7440-43-9	Cadmium	1.1			P
7440-70-2	Calcium	5440			P
7440-47-3	Chromium	19.9			P
7440-48-4	Cobalt	4.7	B		P
7440-50-8	Copper	13.7		E JL	P
7439-89-6	Iron	16000			P
7439-92-1	Lead	44.0			P
7439-95-4	Magnesium	4300		E JL	P
7439-96-5	Manganese	450			P
7439-97-6	Mercury	0.05	U		CV
7440-02-0	Nickel	18.8			P
7440-09-7	Potassium	1460			P
7782-49-2	Selenium	0.71	U	N*UJK	P
7440-22-4	Silver	0.60	B		P
7440-23-5	Sodium	133	B		P
7440-28-0	Thallium	0.81	U		P
7440-62-2	Vanadium	23.7			P
7440-66-6	Zinc	109			P
	Cyanide				NR

CP 7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0970

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38225S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 35.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1200			P
7440-36-0	Antimony	1.7	U		P
7440-38-2	Arsenic	2.2	U		P
7440-39-3	Barium	59.8	B		P
7440-41-7	Beryllium	0.11	U		P
7440-43-9	Cadmium	0.23	B		P
7440-70-2	Calcium	91500			P
7440-47-3	Chromium	3.7	B		P
7440-48-4	Cobalt	0.61	U		P
7440-50-8	Copper	3.6	B	E JL	P
7439-89-6	Iron	2600			P
7439-92-1	Lead	5.5			P
7439-95-4	Magnesium	1290	B	E JL	P
7439-96-5	Manganese	73.0			P
7439-97-6	Mercury	0.13	U		CV
7440-02-0	Nickel	2.9	B		P
7440-09-7	Potassium	300	B		P
7782-49-2	Selenium	1.9	U	N/UJK	P
7440-22-4	Silver	0.44	U		P
7440-23-5	Sodium	317	B		P
7440-28-0	Thallium	2.2	U		P
7440-62-2	Vanadium	4.2	B		P
7440-66-6	Zinc	16.2			P
	Cyanide				NR

VP 7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0971

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38226S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 48.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5740			P
7440-36-0	Antimony	1.2	U		P
7440-38-2	Arsenic	4.8		JL	P
7440-39-3	Barium	148			P
7440-41-7	Beryllium	0.24	B		P
7440-43-9	Cadmium	1.0	B		P
7440-70-2	Calcium	121000			P
7440-47-3	Chromium	14.7			P
7440-48-4	Cobalt	4.3	B		P
7440-50-8	Copper	16.1		E JL	P
7439-89-6	Iron	9520			P
7439-92-1	Lead	22.2			P
7439-95-4	Magnesium	3410		E JL	P
7439-96-5	Manganese	564			P
7439-97-6	Mercury	0.10	U		CV
7440-02-0	Nickel	16.7			P
7440-09-7	Potassium	1140	B		P
7782-49-2	Selenium	2.1		N JL	P
7440-22-4	Silver	0.39	B		P
7440-23-5	Sodium	291	B		P
7440-28-0	Thallium	1.6	U		P
7440-62-2	Vanadium	16.1	B		P
7440-66-6	Zinc	95.2			P
	Cyanide				NR

CF 7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0972

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38227S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 63.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7140			P
7440-36-0	Antimony	3.3	B		P
7440-38-2	Arsenic	8.6			P
7440-39-3	Barium	273			P
7440-41-7	Beryllium	0.32	B		P
7440-43-9	Cadmium	21.5			P
7440-70-2	Calcium	155000			P
7440-47-3	Chromium	21.3			P
7440-48-4	Cobalt	5.5	B		P
7440-50-8	Copper	42.5		E JL	P
7439-89-6	Iron	11700			P
7439-92-1	Lead	84.8			P
7439-95-4	Magnesium	4990		E JL	P
7439-96-5	Manganese	277			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	36.8			P
7440-09-7	Potassium	1340	B		P
7782-49-2	Selenium	28.4		N JL	P
7440-22-4	Silver	0.71	B		P
7440-23-5	Sodium	236	B		P
7440-28-0	Thallium	1.2	U		P
7440-62-2	Vanadium	21.1			P
7440-66-6	Zinc	403			P
	Cyanide				NR

CP 7-5-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0973

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38228S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 73.4

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11500			P
7440-36-0	Antimony	4.8	B		P
7440-38-2	Arsenic	15.9			P
7440-39-3	Barium	210			P
7440-41-7	Beryllium	0.60	B		P
7440-43-9	Cadmium	11.4			P
7440-70-2	Calcium	16900			P
7440-47-3	Chromium	23.1			P
7440-48-4	Cobalt	8.0	B		P
7440-50-8	Copper	42.2		E JL	P
7439-89-6	Iron	19300			P
7439-92-1	Lead	478			P
7439-95-4	Magnesium	5630		E JL	P
7439-96-5	Manganese	594			P
7439-97-6	Mercury	0.14	B		CV
7440-02-0	Nickel	20.7			P
7440-09-7	Potassium	2540			P
7782-49-2	Selenium	0.92	U	M/UJK	P
7440-22-4	Silver	1.1	B		P
7440-23-5	Sodium	174	B		P
7440-28-0	Thallium	1.1	U		P
7440-62-2	Vanadium	31.7			P
7440-66-6	Zinc	581			P
	Cyanide				NR

CP 7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0974

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38229S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 95.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11300			P
7440-36-0	Antimony	1.8	B		P
7440-38-2	Arsenic	7.7			P
7440-39-3	Barium	219			P
7440-41-7	Beryllium	0.60	B		P
7440-43-9	Cadmium	3.4			P
7440-70-2	Calcium	8070			P
7440-47-3	Chromium	23.6			P
7440-48-4	Cobalt	6.6	B		P
7440-50-8	Copper	51.8		E JL	P
7439-89-6	Iron	20200			P
7439-92-1	Lead	208			P
7439-95-4	Magnesium	6580		E JL	P
7439-96-5	Manganese	193			P
7439-97-6	Mercury	0.14			CV
7440-02-0	Nickel	19.5			P
7440-09-7	Potassium	1290			P
7782-49-2	Selenium	1.4		N JL	P
7440-22-4	Silver	1.0	B		P
7440-23-5	Sodium	173	B		P
7440-28-0	Thallium	0.81	U		P
7440-62-2	Vanadium	33.8			P
7440-66-6	Zinc	379			P
	Cyanide				NR

7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0975

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38230S

Level (low/med): LOW Date Received: 05/26/01

% Solids: 42.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2300			P
7440-36-0	Antimony	1.4	U		P
7440-38-2	Arsenic	1.9	U		P
7440-39-3	Barium	198			P
7440-41-7	Beryllium	0.09	U		P
7440-43-9	Cadmium	0.86	B		P
7440-70-2	Calcium	185000			P
7440-47-3	Chromium	4.8			P
7440-48-4	Cobalt	1.0	B		P
7440-50-8	Copper	4.9	B	~~E~~ JL	P
7439-89-6	Iron	3160			P
7439-92-1	Lead	10.8			P
7439-95-4	Magnesium	2910		~~E~~ JL	P
7439-96-5	Manganese	301			P
7439-97-6	Mercury	0.11	U		CV
7440-02-0	Nickel	4.1	B		P
7440-09-7	Potassium	571	B		P
7782-49-2	Selenium	1.6	U	~~N~~*UJK	P
7440-22-4	Silver	0.37	U		P
7440-23-5	Sodium	327	B		P
7440-28-0	Thallium	1.8	U		P
7440-62-2	Vanadium	5.2	B		P
7440-66-6	Zinc	31.4			P
	Cyanide				NR

DP 4-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0977

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38281S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 84.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8840			P
7440-36-0	Antimony	0.81	B		P
7440-38-2	Arsenic	7.0			P
7440-39-3	Barium	155			P
7440-41-7	Beryllium	0.48	B		P
7440-43-9	Cadmium	0.54	B		P
7440-70-2	Calcium	10500			P
7440-47-3	Chromium	26.1			P
7440-48-4	Cobalt	6.7	B		P
7440-50-8	Copper	26.8		E JL	P
7439-89-6	Iron	18700			P
7439-92-1	Lead	73.8			P
7439-95-4	Magnesium	7400		E JL	P
7439-96-5	Manganese	291			P
7439-97-6	Mercury	0.18			CV
7440-02-0	Nickel	20.2			P
7440-09-7	Potassium	1270			P
7782-49-2	Selenium	1.8		N JL	P
7440-22-4	Silver	0.74	B		P
7440-23-5	Sodium	260	B		P
7440-28-0	Thallium	0.90	U		P
7440-62-2	Vanadium	32.3			P
7440-66-6	Zinc	238			P
	Cyanide				NR

JP 7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0978

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38282S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 54.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5890			P
7440-36-0	Antimony	2.4	B		P
7440-38-2	Arsenic	4.5			P
7440-39-3	Barium	102			P
7440-41-7	Beryllium	0.30	B		P
7440-43-9	Cadmium	4.8			P
7440-70-2	Calcium	5630			P
7440-47-3	Chromium	14.4			P
7440-48-4	Cobalt	5.3	B		P
7440-50-8	Copper	22.3		~~J~~ JL	P
7439-89-6	Iron	14300			P
7439-92-1	Lead	151			P
7439-95-4	Magnesium	3120		~~J~~ JL	P
7439-96-5	Manganese	139			P
7439-97-6	Mercury	0.09	U		CV
7440-02-0	Nickel	12.1	B		P
7440-09-7	Potassium	1540	B		P
7782-49-2	Selenium	2.4		~~N~~ JL	P
7440-22-4	Silver	0.67	B		P
7440-23-5	Sodium	148	B		P
7440-28-0	Thallium	1.4	U	UJK	P
7440-62-2	Vanadium	24.9			P
7440-66-6	Zinc	220			P
	Cyanide				NR

CP 7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0979

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29276 SAS No.: SDG No.: MJ0968

Matrix (soil/water): SOIL Lab Sample ID: 38283S

Level (low/med): LOW Date Received: 06/05/01

% Solids: 66.8

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8130			P
7440-36-0	Antimony	0.89	U		P
7440-38-2	Arsenic	4.9			P
7440-39-3	Barium	127			P
7440-41-7	Beryllium	0.19	B		P
7440-43-9	Cadmium	0.79	B		P
7440-70-2	Calcium	15600			P
7440-47-3	Chromium	13.8			P
7440-48-4	Cobalt	8.5	B		P
7440-50-8	Copper	26.7		~~E~~ JL	P
7439-89-6	Iron	19100			P
7439-92-1	Lead	16.5			P
7439-95-4	Magnesium	4290		~~E~~ JL	P
7439-96-5	Manganese	358			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	29.8			P
7440-09-7	Potassium	694	B		P
7782-49-2	Selenium	1.6		~~W~~ JL	P
7440-22-4	Silver	0.79	B		P
7440-23-5	Sodium	139	B		P
7440-28-0	Thallium	1.2	U	UJK	P
7440-62-2	Vanadium	18.2			P
7440-66-6	Zinc	134			P
	Cyanide				NR

CP 7-9-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

ENVIRONMENTAL SERVICES ASSISTANCE TEAM

ESAT Region 10
7411 Beach Drive East
Port Orchard, WA 98366
Phone (360) 871-8723

DELIVERABLE NARRATIVE

DATE: August 8, 2001

To: Ginna Grepo-Grove, TOPO, USEPA, Region 10

THROUGH: Dave Dobb, Team Manager, ESAT Region 10 DD

FROM: Chris Pace, Data Validation Task Lead, ESAT Region 10 CP

SUBJECT: Data Validation Report for the Inorganic Analysis of Samples from the Upper Columbia River Lake Roosevelt/Mines Sites. Case: 29440 SDG: MJ0FK6

Account Code: 01T10P50102D106XLA00

Doc. #: ES10-0-1131
TDN: 1052
Task Order: 001
Contract: 68-W-01-027

CC: Gerald Dodo, PO, USEPA, Region 10
Project File

The quality assurance (QA) review of 15 soil samples collected from the above referenced site has been completed. These samples were analyzed for total metals by Sentinel, Inc. of Huntsville, AL. The following samples were reviewed in this validation report:

MJ0FK6	MJ0FL2	MJ0GP4
MJ0FK7	MJ0GP0	MJ0GP5
MJ0FK8	MJ0GP1	MJ0GP6
MJ0FL0	MJ0GP2	MJ0GP7
MJ0FL1	MJ0GP3	MJ0GP8

DATA QUALIFICATIONS

The following comments refer to the laboratory performance in meeting the Quality Control Specifications outlined in the Contract Laboratory Program (CLP) Statement of Work (SOW) for Inorganic Analysis (ILM04.1) and the USEPA CLP Functional Guidelines for Inorganic Data Review, 2/94.

The conclusions presented herein are based on the information provided for the review.

Holding Time - Acceptable

The suggested holding time for mercury is 28 days from the date of sample collection and the holding time for the rest of the metals is 180 days. The samples were collected on 6/26, 6/27, 6/28, 6/29/01. The samples were analyzed for mercury within 18 days and all other metals within 21days of the sample collection date. None of the data were qualified on this basis.

Sample Preparation - Acceptable

The samples were prepared in accordance with the methods used. None of the data were qualified on this basis.

Initial Calibration - Acceptable

All of the samples were analyzed for total mercury using Cold Vapor Atomic Absorption Spectroscopy (CVAAS). The initial calibration for mercury met the frequency of analysis and the linearity criteria (correlation coefficients, r=>0.995).

The rest of the target analytes were analyzed using Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-AES). The initial calibration for ICP-AES met the frequency of analysis and the linearity criteria (correlation coefficients, r=>0.995).

None of the data were qualified on this basis.

Calibration Verification - Acceptable

The initial and continuing calibration verifications met the criteria for frequency of analysis and recovery criteria of 90-110% and 80-120% for mercury. The recoveries ranged from 96-107% for ICP-AES and from 82-104% for mercury. None of the data were qualified on this basis.

Detection Limits - Acceptable

All of the target analytes met the project required quantitation limits. All of the Contract Required Detection Limit (CRDL) checks met the frequency of analysis and recovery criteria.

Blanks

Procedural blanks were prepared with the samples to indicate potential contamination from the digestion or analytical procedure. If an analyte was found in the associated blank, the sample results were qualified as non-detects, "U", if the analyte concentration is less than five times the analytical value in the blank.

The frequency of analysis of blanks was met. Based on the target analytes detected in the procedural, initial and continuing calibration blanks, the following results were qualified as non-detects, "U":

Analyte	Associated Samples
sodium	MJ0FL2
thallium	MJ0FK7, MJ0FK8, MJ0FL0

ICP-AES Interference Check Sample - Acceptable

The ICP-AES interference check samples (ICS) were analyzed to verify inter-element and background correction factors. The frequency of analysis (beginning and end of sequence) and recovery criteria (80-120%) were met. The recoveries ranged from 93-119%. None of the data were qualified on this basis.

ICP-AES Serial Dilution Analysis

Sample MJ0FK6 was analyzed for serial dilution. All of the analytes which exceeded the minimum concentration criterion (50 times the IDL) agreed within 10% difference with the exception of calcium, copper and zinc. Zinc only slightly exceeded the 10% difference criteria and therefore, was not qualified on this basis. Results for calcium and copper in all samples were qualified as estimated, "J". The "E" qualifiers applied by the laboratory were crossed-out by the reviewer.

Laboratory Control Sample - Acceptable

The frequency of analysis and the recovery criteria for the laboratory control sample was met. The recoveries ranged from 63-148%. None of the data were qualified on this basis.

Duplicate Sample Analysis

Sample MJ0FK6 was utilized for duplicate analysis. The duplicate results met the frequency of analysis and method control limit criteria (±20% RPD or ± CRDL) for all target analytes with the exception of cadmium, lead, magnesium and zinc. Cadmium and zinc did meet the suggested technical control limit criteria (±35% RPD or ± 2X CRDL) for soils while lead and magnesium did not. Results for lead and magnesium in all samples were qualified as estimated, "J". The "*" qualifiers applied by the laboratory were crossed-out by the reviewer.

Matrix Spike Analysis

Sample MJ0FK6 was used for the spike analysis. The frequency of analysis and recovery criteria were met with the exception of antimony (71%) in the spike sample MJ0FK6S. Due to possible bias, the detected and non-detected antimony results in all samples were qualified as estimated, "J/UJ". The "N" qualifiers applied by the laboratory were crossed-out by the reviewer. The recoveries for lead and zinc could not be accurately determined because the concentrations native to the sample were greater than 4 times the amount of spike added to the sample. All of the other spike recoveries were acceptable and ranged from 83-118%.

Laboratory Contact

The laboratory was not contacted for this review.

Overall Assessment

The total number of data points was 345. Four (1.2%) were qualified as non-detected due to blank contamination. Seventy five (22%) were qualified as estimated due to ICP serial dilution, duplicate and spike analyses.

All of the samples were analyzed in accordance with technical specifications outlined in the SOW. The data, as qualified, are acceptable and can be used for all purposes.

DATA QUALIFIERS

U	-	The analyte was not detected at or above the reported result.
J	-	The analyte was positively identified. The associated numerical result is an estimate.
R	-	The data are unusable for all purposes.
N	-	There is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result. The associated numerical value is an estimate of the quantitation limit of the analyte in this sample.
L	-	Low bias.
H	-	High bias.
Q	-	The result is estimated because the concentration is below the Contract Required Quantitation Limits (CRQLs).
K	-	Unknown Bias.

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

ICP ID Number: P3 Date: 07/15/01

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium	317.90		5000	73.1	P
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR
Cyanide			10		NR

Comments:

P3: THERM0 JARRELL ASH

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

ICP ID Number: P4 Date: 07/15/01

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	17.7	P
Antimony	206.80		60	2.9	P
Arsenic	189.00		10	4.6	P
Barium	493.40		200	0.7	P
Beryllium	313.00		5	0.1	P
Cadmium	226.50		5	0.2	P
Calcium	317.90		5000	40.4	P
Chromium	267.70		10	0.4	P
Cobalt	228.60		50	1.1	P
Copper	324.70		25	0.9	P
Iron	271.40		100	9.8	P
Lead	220.30		3	1.8	P
Magnesium	279.00		5000	13.5	P
Manganese	257.60		15	0.3	P
Mercury			0.2		NR
Nickel	231.60		40	1.6	P
Potassium	766.40		5000	9.7	P
Selenium	196.00		5	3.4	P
Silver	328.00		10	0.3	P
Sodium	330.20		5000	114.2	P
Thallium	190.80		10	5.1	P
Vanadium	292.40		50	0.7	P
Zinc	206.20		20	0.9	P
Cyanide			10		NR

Comments:

P4: THERMO JARRELL ASH

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

ICP ID Number: Date: 04/15/01

Flame AA ID Number: C5

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.1	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR
Cyanide			10		NR

Comments:

C5: CETAC M6000

13
PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Method: P

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	07/12/01	1.00	200
MJ0FK6	07/12/01	1.00	200
MJ0FK6D	07/12/01	1.00	200
MJ0FK6S	07/12/01	1.00	200
MJ0FK7	07/12/01	1.00	200
MJ0FK8	07/12/01	1.00	200
MJ0FL0	07/12/01	1.00	200
MJ0FL1	07/12/01	1.02	200
MJ0FL2	07/12/01	1.02	200
MJ0GP0	07/12/01	1.00	200
MJ0GP1	07/12/01	1.00	200
MJ0GP2	07/12/01	1.01	200
MJ0GP3	07/12/01	1.02	200
MJ0GP4	07/12/01	1.01	200
MJ0GP5	07/12/01	1.02	200
MJ0GP6	07/12/01	1.02	200
MJ0GP7	07/12/01	1.00	200
MJ0GP8	07/12/01	1.01	200
PBS	07/12/01	1.00	200

13
PREPARATION LOG

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Method: CV

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	07/12/01	0.20	100
MJ0FK6	07/12/01	0.20	100
MJ0FK6D	07/12/01	0.20	100
MJ0FK6S	07/12/01	0.20	100
MJ0FK7	07/12/01	0.22	100
MJ0FK8	07/12/01	0.22	100
MJ0FL0	07/12/01	0.20	100
MJ0FL1	07/12/01	0.22	100
MJ0FL2	07/12/01	0.22	100
MJ0GP0	07/12/01	0.21	100
MJ0GP1	07/12/01	0.22	100
MJ0GP2	07/12/01	0.20	100
MJ0GP3	07/12/01	0.21	100
MJ0GP4	07/12/01	0.22	100
MJ0GP5	07/12/01	0.20	100
MJ0GP6	07/12/01	0.21	100
MJ0GP7	07/12/01	0.21	100
MJ0GP8	07/12/01	0.21	100
PBS	07/12/01	0.20	100

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0FL0

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39298S

Level (low/med): LOW Date Received: 06/30/01

% Solids: 78.3

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	235			P
7440-36-0	Antimony	2.0	B	N JL	P
7440-38-2	Arsenic	4.1			P
7440-39-3	Barium	26.0	B		P
7440-41-7	Beryllium	0.03	U		P
7440-43-9	Cadmium	7.9		*	P
7440-70-2	Calcium	292000		E JL	P
7440-47-3	Chromium	0.72	B		P
7440-48-4	Cobalt	0.28	U		P
7440-50-8	Copper	533		E JL	P
7439-89-6	Iron	896			P
7439-92-1	Lead	7690		* JK	P
7439-95-4	Magnesium	17000		* JK	P
7439-96-5	Manganese	118			P
7439-97-6	Mercury	0.12	B		CV
7440-02-0	Nickel	4.2	B		P
7440-09-7	Potassium	117	B		P
7782-49-2	Selenium	0.87	U		P
7440-22-4	Silver	1.4	B		P
7440-23-5	Sodium	337	B		P
7440-28-0	Thallium	1.3	B	U	P
7440-62-2	Vanadium	9.4	B		P
7440-66-6	Zinc	2010		*E	P
	Cyanide				NR

8-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0FL2

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39300S

Level (low/med): LOW Date Received: 06/30/01

% Solids: 74.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	9280			P
7440-36-0	Antimony	0.76	U	~~N~~ UJK	P
7440-38-2	Arsenic	4.5			P
7440-39-3	Barium	24.9	B		P
7440-41-7	Beryllium	0.07	B		P
7440-43-9	Cadmium	0.66	B	~~J~~	P
7440-70-2	Calcium	6400		~~J~~ JL	P
7440-47-3	Chromium	16.8			P
7440-48-4	Cobalt	15.0			P
7440-50-8	Copper	9.9		~~J~~ JL	P
7439-89-6	Iron	25400			P
7439-92-1	Lead	51.8		~~J~~ JK	P
7439-95-4	Magnesium	7110		~~J~~ JK	P
7439-96-5	Manganese	293			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	24.7			P
7440-09-7	Potassium	367	B		P
7782-49-2	Selenium	0.89	U		P
7440-22-4	Silver	0.81	B		P
7440-23-5	Sodium	279	B	U	P
7440-28-0	Thallium	1.3	U		P
7440-62-2	Vanadium	10.1	B		P
7440-66-6	Zinc	240		~~J~~	P
	Cyanide				NR

CF 8-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0GP0

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39477S

Level (low/med): LOW Date Received: 07/06/01

% Solids: 80.3

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6170			P
7440-36-0	Antimony	18.8		N JL	P
7440-38-2	Arsenic	7.5			P
7440-39-3	Barium	255			P
7440-41-7	Beryllium	0.23	B		P
7440-43-9	Cadmium	1.6		*	P
7440-70-2	Calcium	29100		E JL	P
7440-47-3	Chromium	18.0			P
7440-48-4	Cobalt	7.4	B		P
7440-50-8	Copper	238		E JL	P
7439-89-6	Iron	25000			P
7439-92-1	Lead	230		* JK	P
7439-95-4	Magnesium	12300		* JK	P
7439-96-5	Manganese	477			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	8.4	B		P
7440-09-7	Potassium	1170	B		P
7782-49-2	Selenium	0.85	U		P
7440-22-4	Silver	1.9	B		P
7440-23-5	Sodium	463	B		P
7440-28-0	Thallium	1.3	U		P
7440-62-2	Vanadium	20.8			P
7440-66-6	Zinc	1520		E*	P
	Cyanide				NR

CP 8-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0GP1

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39478S

Level (low/med): LOW Date Received: 07/06/01

% Solids: 75.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	13400			P
7440-36-0	Antimony	40.1		N JL	P
7440-38-2	Arsenic	15.0			P
7440-39-3	Barium	1270			P
7440-41-7	Beryllium	0.54	B		P
7440-43-9	Cadmium	0.81	B		P
7440-70-2	Calcium	47600		JL	P
7440-47-3	Chromium	85.0			P
7440-48-4	Cobalt	34.6			P
7440-50-8	Copper	1540		JL	P
7439-89-6	Iron	134000			P
7439-92-1	Lead	246		JK	P
7439-95-4	Magnesium	6900		JK	P
7439-96-5	Manganese	2540			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	13.1			P
7440-09-7	Potassium	2800			P
7782-49-2	Selenium	0.91	U		P
7440-22-4	Silver	7.8			P
7440-23-5	Sodium	1430			P
7440-28-0	Thallium	1.4	U		P
7440-62-2	Vanadium	31.7			P
7440-66-6	Zinc	10500			P
	Cyanide				NR

8-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0GP2

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39479S

Level (low/med): LOW Date Received: 07/06/01

% Solids: 73.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15700			P
7440-36-0	Antimony	49.1		~~N~~ JL	P
7440-38-2	Arsenic	19.3			P
7440-39-3	Barium	1610			P
7440-41-7	Beryllium	0.62	B		P
7440-43-9	Cadmium	0.74	B	~~*~~	P
7440-70-2	Calcium	56000		~~E~~ JL	P
7440-47-3	Chromium	103			P
7440-48-4	Cobalt	41.1			P
7440-50-8	Copper	2070		~~E~~ JL	P
7439-89-6	Iron	167000			P
7439-92-1	Lead	292		~~*~~ JK	P
7439-95-4	Magnesium	5960		~~*~~ JK	P
7439-96-5	Manganese	3140			P
7439-97-6	Mercury	0.07	U		CV
7440-02-0	Nickel	14.7			P
7440-09-7	Potassium	3340			P
7782-49-2	Selenium	0.91	U		P
7440-22-4	Silver	7.8			P
7440-23-5	Sodium	1760			P
7440-28-0	Thallium	1.4	U		P
7440-62-2	Vanadium	33.4			P
7440-66-6	Zinc	13000		~~E~~	P
	Cyanide				NR

CP 8-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0GP3

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39480S

Level (low/med): LOW Date Received: 07/06/01

% Solids: 75.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	17800			P
7440-36-0	Antimony	44.9		N JL	P
7440-38-2	Arsenic	23.9			P
7440-39-3	Barium	1910			P
7440-41-7	Beryllium	0.71	B		P
7440-43-9	Cadmium	1.5			P
7440-70-2	Calcium	63900		E JL	P
7440-47-3	Chromium	121			P
7440-48-4	Cobalt	45.9			P
7440-50-8	Copper	2530		E JL	P
7439-89-6	Iron	193000			P
7439-92-1	Lead	388		JK	P
7439-95-4	Magnesium	5800		JK	P
7439-96-5	Manganese	3630			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	15.8			P
7440-09-7	Potassium	3870			P
7782-49-2	Selenium	0.89	U		P
7440-22-4	Silver	8.2			P
7440-23-5	Sodium	1960			P
7440-28-0	Thallium	1.3	U		P
7440-62-2	Vanadium	36.5			P
7440-66-6	Zinc	15100		E	P
	Cyanide				NR

CP 8-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0GP4

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39481S

Level (low/med): LOW Date Received: 07/06/01

% Solids: 78.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19200			P
7440-36-0	Antimony	59.4		N JL	P
7440-38-2	Arsenic	41.4			P
7440-39-3	Barium	2150			P
7440-41-7	Beryllium	0.79	B		P
7440-43-9	Cadmium	1.7		N	P
7440-70-2	Calcium	70200		E JL	P
7440-47-3	Chromium	139			P
7440-48-4	Cobalt	54.2			P
7440-50-8	Copper	2960		E JL	P
7439-89-6	Iron	212000			P
7439-92-1	Lead	507		N JK	P
7439-95-4	Magnesium	5830		N JK	P
7439-96-5	Manganese	4130			P
7439-97-6	Mercury	0.06	U		CV
7440-02-0	Nickel	17.6			P
7440-09-7	Potassium	4260			P
7782-49-2	Selenium	0.86	U		P
7440-22-4	Silver	10.3			P
7440-23-5	Sodium	2400			P
7440-28-0	Thallium	1.3	U		P
7440-62-2	Vanadium	39.8			P
7440-66-6	Zinc	16900		N	P
	Cyanide				NR

CP 8-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0GP5

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39482S

Level (low/med): LOW Date Received: 07/06/01

% Solids: 67.1

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7170			P
7440-36-0	Antimony	10.9	B	~~N~~ JL	P
7440-38-2	Arsenic	10.9			P
7440-39-3	Barium	582			P
7440-41-7	Beryllium	0.29	B		P
7440-43-9	Cadmium	3.3		~~*~~	P
7440-70-2	Calcium	33300		~~E~~ JL	P
7440-47-3	Chromium	25.9			P
7440-48-4	Cobalt	9.8	B		P
7440-50-8	Copper	349		~~E~~ JL	P
7439-89-6	Iron	44900			P
7439-92-1	Lead	470		~~*~~ JK	P
7439-95-4	Magnesium	13900		~~*~~ JK	P
7439-96-5	Manganese	864			P
7439-97-6	Mercury	0.08	B		CV
7440-02-0	Nickel	10.5	B		P
7440-09-7	Potassium	1570			P
7782-49-2	Selenium	0.99	U		P
7440-22-4	Silver	2.8	B		P
7440-23-5	Sodium	807	B		P
7440-28-0	Thallium	1.5	U		P
7440-62-2	Vanadium	28.6			P
7440-66-6	Zinc	3920		~~*~~ ~~E~~	P
	Cyanide				NR

VP 9-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0GP6

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39483S

Level (low/med): LOW Date Received: 07/06/01

% Solids: 73.3

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7250			P
7440-36-0	Antimony	19.2		N JL	P
7440-38-2	Arsenic	12.3			P
7440-39-3	Barium	762			P
7440-41-7	Beryllium	0.30	B		P
7440-43-9	Cadmium	4.9		E	P
7440-70-2	Calcium	40500		E JL	P
7440-47-3	Chromium	22.4			P
7440-48-4	Cobalt	8.8	B		P
7440-50-8	Copper	257		E JL	P
7439-89-6	Iron	35900			P
7439-92-1	Lead	548		* JK	P
7439-95-4	Magnesium	18700		* JK	P
7439-96-5	Manganese	617			P
7439-97-6	Mercury	0.11	B		CV
7440-02-0	Nickel	14.7			P
7440-09-7	Potassium	1520			P
7782-49-2	Selenium	0.91	U		P
7440-22-4	Silver	2.3	B		P
7440-23-5	Sodium	528	B		P
7440-28-0	Thallium	1.4	U		P
7440-62-2	Vanadium	28.4			P
7440-66-6	Zinc	2800		*E	P
	Cyanide				NR

CP 8-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MJ0GP7

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39484S

Level (low/med): LOW Date Received: 07/06/01

% Solids: 70.5

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7180			P
7440-36-0	Antimony	8.6	B	~~N~~ JL	P
7440-38-2	Arsenic	11.1			P
7440-39-3	Barium	8.04			P
7440-41-7	Beryllium	0.28	B		P
7440-43-9	Cadmium	3.0		~~*~~	P
7440-70-2	Calcium	38400		~~E~~ JL	P
7440-47-3	Chromium	24.8			P
7440-48-4	Cobalt	7.9	B		P
7440-50-8	Copper	347		~~E~~ JL	P
7439-89-6	Iron	54600			P
7439-92-1	Lead	597		~~*~~ JK	P
7439-95-4	Magnesium	15500		~~*~~ JK	P
7439-96-5	Manganese	1190			P
7439-97-6	Mercury	0.08	B		CV
7440-02-0	Nickel	9.2	B		P
7440-09-7	Potassium	1450			P
7782-49-2	Selenium	1.1	B		P
7440-22-4	Silver	2.8			P
7440-23-5	Sodium	695	B		P
7440-28-0	Thallium	1.4	U		P
7440-62-2	Vanadium	28.1			P
7440-66-6	Zinc	5430		~~*E~~	P
	Cyanide				NR

8-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments:

EPA SAMPLE NO.

INORGANIC ANALYSIS DATA SHEET

MJ0GP8

Lab Name: Sentinel, Inc. Contract: 68-W-00-085

Lab Code: SENTIN Case No.: 29440 SAS No.: SDG No.: MJ0FK6

Matrix (soil/water): SOIL Lab Sample ID: 39485S

Level (low/med): LOW Date Received: 07/06/01

% Solids: 80.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7530			P
7440-36-0	Antimony	9.4	B	N JL	P
7440-38-2	Arsenic	15.9			P
7440-39-3	Barium	411			P
7440-41-7	Beryllium	0.24	B		P
7440-43-9	Cadmium	3.2		*	P
7440-70-2	Calcium	21300		E JL	P
7440-47-3	Chromium	20.0			P
7440-48-4	Cobalt	11.4	B		P
7440-50-8	Copper	357		E JL	P
7439-89-6	Iron	54200			P
7439-92-1	Lead	845		* JK	P
7439-95-4	Magnesium	6680		* JK	P
7439-96-5	Manganese	1170			P
7439-97-6	Mercury	0.29			CV
7440-02-0	Nickel	12.8			P
7440-09-7	Potassium	1830			P
7782-49-2	Selenium	0.83	U		P
7440-22-4	Silver	3.1			P
7440-23-5	Sodium	870	B		P
7440-28-0	Thallium	1.3	U		P
7440-62-2	Vanadium	24.5			P
7440-66-6	Zinc	5280		E	P
	Cyanide				NR

11-8-01

Color Before: BROWN Clarity Before: Texture: MEDIUM

Color After: YELLOW Clarity After: Artifacts:

Comments: